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August 12, 1935

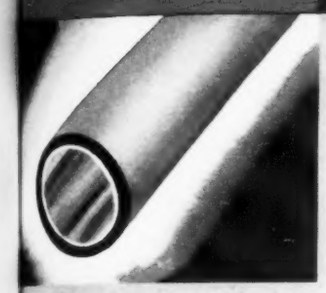
STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

HOW
RANITE CITY
GACLAD STEEL
aves
Money

GRANITE CITY STEEL CO.



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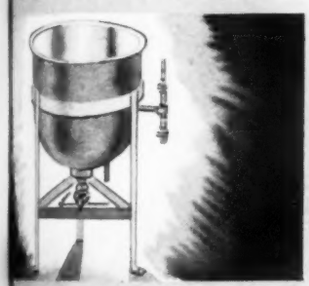

d Retorts, Vats, Barrels, Drums,
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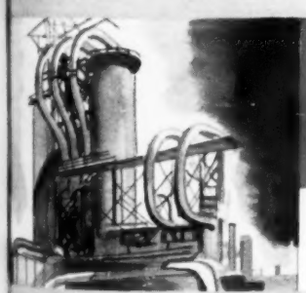
regular steel.



es a protective liner for oil
etc. Saves cost of complete
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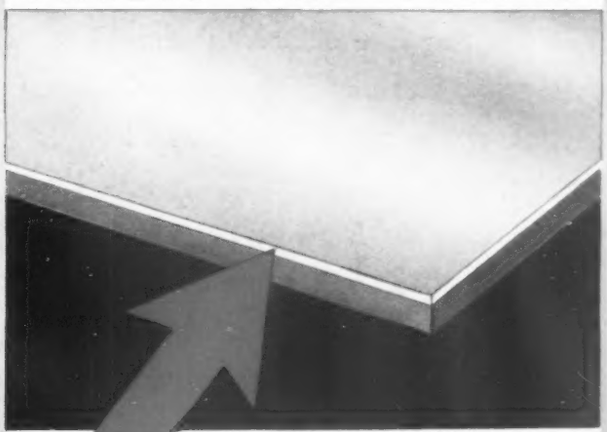
money, yet gives full
stainless service.

GRANITE CITY
INGACLAD
STEEL
SHEETS AND PLATES



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It's STAINLESS CLAD
TO GIVE STAINLESS SERVICE AT LOWER COST • • •

NO NEED FOR *RE-ANNEALING* AFTER WELDING.
MAKES PERFECT WELDS EVEN IN HEAVY GAUGES.

SINCE
GRANITE CITY STEEL
1878

GRANITE CITY STEEL CO.
GRANITE CITY • • ILLINOIS

TONCAN IRON CONVEYOR

RESISTS SALT CORROSION

In this conveyor, 8 tons of granulated salt per hour move through the Toncan Iron casing—vertically, horizontally, around bends, wherever the conveyor is directed in the salt plant.

Theoretically, dry salt, like most chemicals in a dry state, should not cause corrosion. This condition of dryness, however, is seldom obtained due to moisture present in the air and the hygroscopic character of many compounds. Consequently, it was common sense to use a corrosion-resisting metal like Toncan Iron in the materials-handling equipment.

Toncan Iron is an alloy of carefully-refined open hearth iron, copper and molybdenum. It has proved its longer life in marine service, in hotels piping ocean water to guest rooms, in the sheet metal on buildings on the seaboard subjected to salt atmosphere, in brine lines in refrigerating systems and in salt wells and salt plants.

Let us tell you more about this modern corrosion-resisting alloy metal—available in all the useful forms. Write for descriptive literature.

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Republic Steel
CORPORATION

GENERAL OFFICES · · · YOUNGSTOWN, OHIO

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STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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Announcing a New Device by

TRADE **YALE** MARK

The PUL-LIFT

THE TOOL OF A 1,000 USES

IT PULLS - IT *LIFTS*

CAPACITIES-
—¾, 1½, 3 and 6 TONS

The PUL-LIFT is the newest development of Yale engineers. In point of utility, economy and safety, it is one of the most important and useful tools presented to industry in a decade.

Loads of all kinds, up to 6 tons, can be moved either horizontally or vertically with the PUL-LIFT.

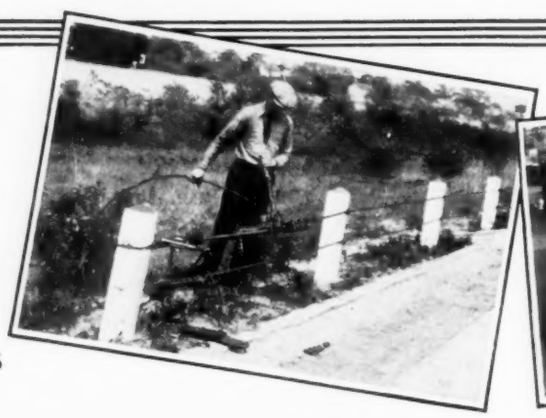
The PUL-LIFT is easy to operate. A quick thumb turn changes the action from lifting to lowering or vice versa.

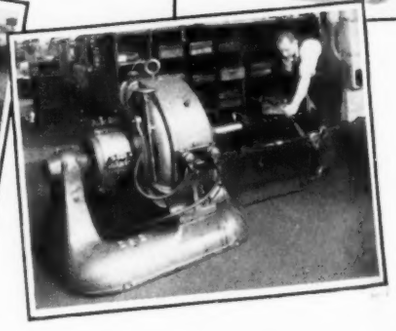
Light in weight, compact and portable, it can be easily transported from one job to another. It is safe, strong and durable having the same outstanding safety factors which distinguish the famous line of Yale Hand Chain Hoists.

The pictures illustrate the universal serviceability of the PUL-LIFT. Ask the nearest Yale distributor to demonstrate how it can serve you.

IT PULLS, IT LIFTS

Unusually light in weight, yet rugged, compact and powerful.





THE YALE & TOWNE MFG. CO.

PHILADELPHIA DIVISION Philadelphia, Pa., U.S.A.

Makers of Yale Hand and Electric Chain Hoists, Trolleys, Electric and Hand Lift Trucks and Skid Platforms

As the Editor Views the News

CURRENT indications point to a sidewise movement in activity in the steel industry during the next fortnight. After gains for five consecutive weeks, production is tapering off gently (p. 63) and demand is noticeably lighter. The index for activity in the broad field of metalworking (p. 28) already has declined moderately, indicating that the expected mid-summer lull is at hand. The important point to remember is that the contraseasonal upward trend in July and early August persisted in spite of extraordinary obstacles—mostly political. The current situation is full of promise for strong business improvement in the early fall. Congress will go home soon!

• • •

A Feather for Institute's Cap

Congratulations are due the American Iron and Steel institute for the improvements it has introduced in the annual statistical report for 1934. In typography and physical appearance (p. 16), the volume surpasses its predecessors by a wide margin. The addition of new series of statistics, particularly those on stainless and other alloy steels (p. 17), indicates a gratifying desire to keep up with changes in the industry. The tendency in this direction contrasts strongly with the reluctance displayed in previous years to depart from the established routine. Equally important as the addition of alloy statistics is the definition of types of steel rating alloy classifications.

• • •

100 Per Cent Amortization?

A novel suggestion to aid the equipment industries was submitted Wednesday to the Senate finance committee. Representatives of Associated Business Papers Inc., of which this publication is a member, urged an amendment to the revenue act of 1934 that would allow purchasers of capital goods the privilege of immediate amortization (p. 20) as a deduction from net income. The plan would permit manufacturers purchasing equipment after Sept. 1, 1935, and prior to Dec. 31, 1936, to deduct the full cost of this equipment on tax returns after Aug. 31, 1935. The advocates of this plan claim that in Germany where it has been tried, it has resulted in a marked stimulation of the durable goods industries. Permission to amortize immediately certainly would promote modernization. The question is whether congress can bring itself to the point of doing anything to help business.

• • •

A Forum for Modernizers

During the past ten weeks STEEL has devoted two pages in each issue to statements by leading machine tool builders on the importance of installing modern equipment to meet present day competition. In this issue the scope of these articles is broadened, under the heading, "Forum on Modernization" (p. 44), to include equipment beyond the machine tool classification. Most of the points brought out in connection with the need of modernization in machine shops are applicable to other productive departments of industrial plants. Whether your operations call for mills, furnaces, fabricating equipment, finishing machinery, material handling apparatus or any other item in the chain of production, you cannot afford to employ obsolete, time and money-wasting equipment.

• • •

Distribution to the Fore!

In perusing the engineering section of this issue (pp. 30-62), the reader will notice reference to a wide range of products in which steel is the principal material. Refrigerators, cash registers, elevators, buses, springs, drums, chain, furnaces, transmissions, filling stations, conveyor belts, hammers, motors, machine tools—just to mention a few. Try to envision the devious channels through which steel is distributed to the manufacturers of these products and you will grasp one phase of the significance of the merger (p. 14) of Inland Steel and Ryerson. The union of this aggressive producer with this largest independent warehouse interest is bound to focus renewed attention (p. 27) among steelmakers upon merchandising and distribution problems.

E. L. Shaner

Industry Weighs Significance Of Inland-Ryerson Merger

AS A RESULT of plans approved by the boards of directors of the Inland Steel Co. and Joseph T. Ryerson & Son Inc., the two companies will be merged on the basis of the issuance of 0.59 of a share of Inland stock for each share of Ryerson stock. Action of the directors is subject to the approval of the stockholders, which is considered assured and merely a formality.

Assets of the combined companies will be $116,705,502. The company will rank seventh in size in the iron and steel industry.

Announcement of the merger action was made unexpectedly Monday, Aug. 5. A statement, signed by L. E. Block, chairman, and P. D. Block, president, of the Inland company, and Edward L. Ryerson Jr., president, and Everett D. Graff, first vice president, of the Ryerson company, was issued as follows:

"The boards of directors of Inland Steel Co. and Joseph T. Ryerson & Son Inc., have approved plans for a union of the two corporations, on the basis of the issuance of 0.59 a share of Inland company stock for each share of Ryerson stock, subject in the case of each company to necessary action of stockholders, and to compliance with applicable governmental requirements.

Retains Corporate Identity

"The plan contemplates the operation of the Ryerson company under its present name and management as a wholly owned subsidiary of the Inland company. It is contemplated that Edward L. Ryerson Jr., is to be active with the Inland company as one of its chief executive officers and that three members of the Ryerson board of directors will become members of the Inland board.

"The amalgamation is of interest to both parties inasmuch as 75 per cent of the various steel products marketed by the Ryerson company through its ten large warehouses in the Central West and East can be produced by Inland.

"The necessary steps to make the plan effective will be taken as speedily as possible."

Joseph T. Ryerson & Son Inc. was incorporated in Illinois in October, 1928, having succeeded other companies which had been in business continuously since 1842. The company maintains warehouses in Chicago, Jersey City, N. J., Philadelphia, Cleveland, Detroit, Buffalo, Cincinnati, St. Louis and Boston. Through Joseph T. Ryerson & Son of Wisconsin Inc., a subsidiary, it maintains stocks in Milwaukee. The Chicago and Jersey City plants embrace facilities for fabrication. The company's warehouses carry a diversified line of finished steel, including bars, plates, shapes, sheets, tubes, rivets, bolts, cold finished steel, alloy steels, numerous alloy specialties and machinery.

Officers of the company are: President, Edward L. Ryerson Jr.; first vice president, Everett D. Graff; vice presidents, George G. Moody, Robert C. Ross and Harold B. Ressler; vice president and treasurer, Ernest L. Hartig, and secretary, Harry W. Treleaven. Directors are Edward L. Ryerson Jr., E. L. Hartig, George G. Moody, Everett D. Graff, Robert C. Ross, Joseph T. Ryerson and Laird Bell.

The Inland Steel Co. was incorporated in 1917 under the laws of Delaware as successor to an Illinois corporation of the same name founded in 1893. The company is a producer of billets, slabs, sheet bars, sheared plates, universal mill plates, floor plates, structural shapes, rivet bars, sheet piling, hot rolled sheets, hot rolled annealed sheets, cold rolled sheets, hot and cold rolled strip, tin plate, galvanized sheets, formed roofing products, standard rails, angle bars, tie plates, spikes, track bolts and nuts, rivets, silo rods and fence posts.

The company operates plants at Chicago Heights, Ill., Indiana Harbor, Ind., and Milwaukee. It owns ore, coal and limestone and lake transportation properties.

Officers of the company are: Chairman, L. E. Block; president, P. D. Block; vice president and general sales manager, Charles R. Robinson; vice presidents, E. J. Block, H. H. Strauss, J. L. Block, F. R. Meyer Jr., A. C. Roeth and C. B. Randall; treasurer, W. D. Truesdale and secretary, J. H. Morris.

Bolsters Market Position

The proposal to merge Ryerson, the largest independent warehouse interest, with Inland, an aggressive, successful independent steel producer is considered in iron and steel circles as a significant move in strengthening the market position of Inland.

Contrary to some opinion, the trend in recent years has not been strongly toward steel producers owning or controlling warehouses, although such a course may develop in the near future.

Only four of the larger steel manufacturers now have their own warehouse facilities: United States Steel Corp., Jones & Laughlin Steel Corp., Inland Steel Co., and Wheeling Steel Corp.

Following the Steel Corporation's acquisition of an interest in the Scully Steel & Iron Co., Chicago, the name of this company was changed to Illinois-Scully Steel Warehouse Co., operating warehouses in St. Louis, St. Paul and Chicago. It was Feb. 1, 1933, when the Corporation decided to put all its other warehouses, comprising five Carnegie units, under Scully management. The name of the company was changed to the Scully Steel Products Co., and it has been operated as a subsidiary of the Corporation.

Jones & Laughlin, from its earliest inception, has operated its own warehouses, under the Jones & Laughlin name, its group now comprising units in Pittsburgh, Detroit, Chicago, Cincinnati, Louisville, Memphis, and New Orleans.

Inland's acquisition of Ryerson gives it ten warehouses, to be operated under the Ryerson name, and as a subsidiary, in Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Jersey City, Boston and Philadelphia.

The four leading interests which have warehouse affiliates — Steel Corporation, Jones & Laughlin, Inland and Wheeling—do not own or control more than a total of 30 warehouse units, whereas 275 of such

Jobber Sales Ratio Grows

A GRADUAL rise in the proportion of steel tonnage sold from warehouses is shown by STEEL'S *annual figures on the distribution of finished rolled steel. The percentage of steel distributed from mills to warehouses rose from* 10.52 *in* 1926 *to* 14.02 *in* 1934.

In 1932—*the low stage in the depression—the percentage rose to* 16.12, *as the size of the majority of steel purchases fell off. Comparisons:*

	Per cent
1934	14.02
1933	14.91
1932	16.12
1931	12.68
1930	12.21
1929	11.05
1928	10.83
1927	12.82
1926	10.52

units are represented in the American Steel Warehouse association.

At the association's convention in Chicago last May it was pointed out that after making partial deductions for huge unit sales from mills to the larger consumers, 42 per cent of all steel produced is taken by less than 100 interests, while 58 per cent goes to the general market, and of the latter portion warehouses sell 21.4 per cent.

Warehouse customers far outnumber those of the mills, the proportion being about 192,000 to 15,000. While 50 per cent of all industrial goods is reported as sold through jobbers, less than 15 per cent of the steel sold is handled by warehouses. The association considered this too low a figure, and proposed measures to increase the ratio.

Inland's acquisition of Ryerson was the subject of considerable discussion in the industry. In this case, a successful steel company obtains a successful sales agency in the intermediary field.

Still To Use Other Sources

Ryerson has been buying a considerable proportion of its steel from Inland. Inland will now sell more steel to Ryerson. To this extent, other steel producers will lose Ryerson business, though Ryerson will continue to buy from other steel sources in territories—such as the East—where it would be unprofitable for Inland to ship steel to Ryerson warehouses.

As to whether this, and other warehouse "hookups" of recent years will accelerate the trend, and more large steel manufacturers will acquire warehouses, opinion in the industry is not definite.

"Production formerly was the one big aim of the mills," said an experienced warehouse representative to STEEL. "Most of the top executives came up through the mills.

"Now, however, steel manufacturers are trying to learn how to sell. Warehouses, on the other hand, have always been sellers. The successful ones know how to sell. They do more creative work in selling. They have been the cradle, or incubator, for steel sales. This is true because many large steel consumers first start in a small way. Their first contact is with the warehouses, and as soon as they have progressed to the point where they are tonnage customers, the mills get their business."

Alaska Mineral Output Up

Mineral output of Alaska in 1934 was valued at $16,721,000, against $10,366,000 in 1933, according to the federal geological survey. Chief mineral was gold, valued at $16,007,000. Copper output was $9700, compared with $1900 in 1933.

Shipbuilders Bid on 13 Navy Vessels Which Will Take 30,000 Tons of Steel

SEALED proposals for the construction of 13 of the 24 naval vessels of the 1935 naval building program were opened Aug. 7 by the secretary of the navy in the presence of navy officials and representatives of shipbuilding companies.

Bids were received for the construction of one light cruiser, one aircraft carrier, eight torpedo boat destroyers and three submarines. Six shipbuilding companies submitted 15 major bids which were accompanied by alternate proposals.

It is estimated that the steel requirements for the 13 vessels will amount to approximately 30,000 tons.

On aircraft carrier No. 7, 14,700 tons, Bethlehem Shipbuilding Corp. quoted $26,000,000 for delivery in 36 months; Newport News Shipbuilding & Dry Dock Co. quoted $24,434,000 for delivery in 38 months.

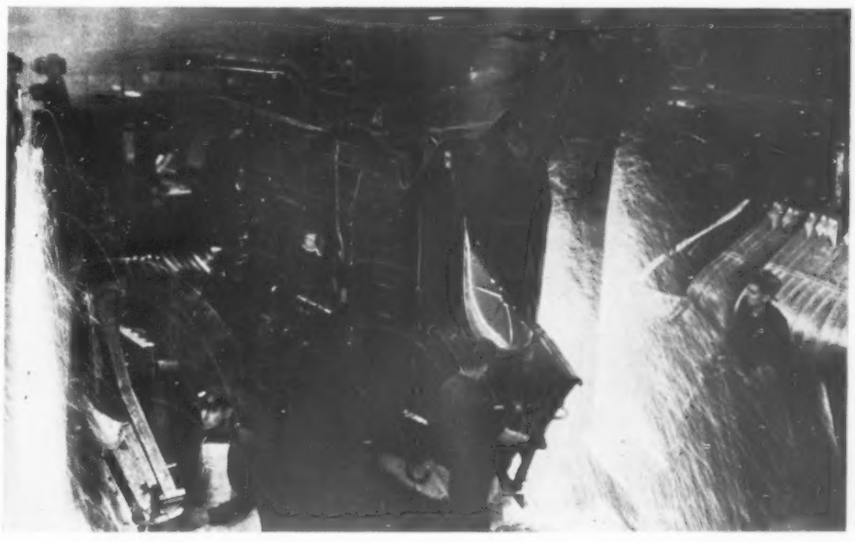
Quotations on light cruiser No. 49, not to exceed 10,000 tons, were as follows: Bethlehem Shipbuilding Corp., $17,600,000; Newport News Shipbuilding & Dry Dock Co., $15,525,000; Federal Shipbuilding & Dry Dock Co., $17,000,000; United Shipbuilding & Dry Dock Co. and United Dry Dock Co. Inc., $17,920,000. Newport News specified delivery in 34 months, the others 36 months.

Electric Boat Co. was the only bidder on three submarines of 1400 tons each.

Bids on three destroyers, not to exceed 1850 tons each, were submitted as follows: Federal Shipbuilding & Dry Dock Co., one vessel, $5,932,000; two vessels, $5,276,000 each; and three vessels, $5,017,000 each. United Shipbuilding & Dry Dock Inc., one vessel, $6,325,000; two vessels, $5,610,000 each; and three vessels, $5,310,000 each. Bath Iron Works Corp., one vessel, $5,400,000; two vessels, $4,620,000 each; and three vessels, $4,360,000 each.

On five destroyers, 1500 tons each, Bethlehem Shipbuilding Corp. submitted a bid for one vessel of $4,560,000, with an additional proposal that if the vessel were constructed as a duplicate of destroyers now being built by the company there would be a deduction of $55,000. Federal Shipbuilding & Dry Dock Co. quoted $5,768,000 for one vessel; $4,930,000 each for two vessels, and $4,693,000 each for three vessels. United Shipbuilding & Dry Dock quoted $5,624,000 on one vessel; $4,962,000 each on two vessels and $4,696,000

What You See Last When the Fords Go By



Cascades of fiery steel sparks fly from the jaws of this giant "balloon" welder as all-steel Ford V-8 bodies are fashioned at the Rouge plant of the Ford Motor Co. at Dearborn, Mich. "Balloon" is the shop term for the rear quarter and back body panels of the Ford V-8 car after they are welded together by powerful currents of electricity. As the jaws of the great welder swing open, workmen slip into place the back panel and the two rear side panels. The jaws are again closed, the workmen step back, an attendant pushes a button and showers of fiery steel sparks fly as the powerful electric current fuses the steel and welds the sections together. The welder has a capacity of as many as 1150 "balloon" sections a day

each on three vessels. Bath Iron Works Corp. bid $5,000,000 on one vessel, $4,260,000 each on two; and $3,975,000 each on three. Bethlehem Shipbuilding Corp. bid on behalf of its Union plant, San Francisco, $4,940,000 on one vessel and $4,600,000 each on two vessels, with the provision for a deduction of $55,000 on each destroyer if they were constructed as duplicates of two now under construction at the Fore River plant. Modifications of all of these proposals were submitted.

New Capacity

THE 90-inch continous broad plate mill, which is to be built at the Homestead works of the Carnegie Steel Co. as announced in the Aug. 5 issue of STEEL, will be housed in a building 300 x 1800 feet. Four continuous reheating furnaces will provide slabs at the proper temperature. The mill proper will consist of one 36 x 100-inch, 2-high, nonreversing scale breaker, one stand of 4-high spreading rolls, one stand of 4-high roughing rolls, and four 4-high finishing stands each equipped with 27-inch diameter work rolls and 54-inch diameter backup rolls, 100 inches wide. The installation also includes the necessary shearing and normalizing equipment.

Meetings

FOUNDRY Equipment Manufacturers' association announces a meeting to be held at the Royal York hotel, Toronto, Ont., on Tuesday evening, Aug. 20, during the convention of the American Foundrymen's association. The program schedules a dinner at 7 p. m., a brief business session, and three addresses as follows: "How the Federal Housing Administration Can Help You Sell Foundry Equipment," by Frank Connolly, assistant to director of industries, federal housing administration, Washington; "Effect of Federal Legislation on the Foundry Equipment Industry," by Thomas W. Pangborn, president, National Founders' association; and "Co-operation in Industry," by Samuel John Frame, secretary and trustee, Metal Exchange, Toronto. All manufacturers of foundry equipment and members of their organizations are invited to attend.

CARROLL HEADS A.I.S.E.E.

G. R. Carroll, electrical superintendent, Aliquippa works, Jones & Laughlin Steel Corp., Aliquippa, Pa., has been elected president of the Association of Iron and Steel Electrical Engineers for the year 1935-36 beginning Aug. 1. He succeeds W. H. Burr, mechanical and electrical superintendent, Lukens Steel Co., Coatesville, Pa. During the past year, Mr. Carroll has served the association as second vice president.

MINING CONGRESS TO CHICAGO

American Mining congress has issued a preliminary program for its annual convention to be held at the Palmer House, Chicago, Sept. 23-27. An exposition is to be conducted in conjunction with the convention, and already some 25 manufacturers of mining equipment and supplies have reserved space. A feature of the exposition will be a mineral states exhibit arranged by the 13 western metal mining states.

B.I.M. GOES TO NEWCASTLE

Twenty-seventh annual autumn meeting of the British Institute of Metals will be held in Newcastle-upon-Tyne from Sept. 9 to 12. The proceedings will begin in the evening of Sept. 9 with the delivery by Dr. H. W. Brownsdon of the fourteenth autumn lecture on "Metal Melting—Its Effect on Quality." The lecture will be discussed—a novelty on such on occasion. Following the technical sessions on Sept. 10 and 11, a number of works visits will be made, and Sept. 12 will be devoted to a whole-day excursion.

¶The annual outing of the New England Foundrymen's association will be held Aug. 14 at the Chopmist Hill Inn, North Scituate, R. I. The program includes the usual Rhode Island clambake served at these outings, sports and entertainment. Charles A. Reed is chairman of the committee of arrangements.

Institute

THE twenty-second Annual Statistical Report of the American Iron and Steel institute, which is just off the press, introduces a number of changes in the arrangement of statistics and presents some figures which have not appeared in previous issues. Typographically the volume represents a marked improvement over its predecessors. Instead of the familiar blue stiff cloth binding, the current issue is bound in flexible dark green fabrikoid.

In this issue figures of total steel production include with steel ingots only that part of steel for castings which was produced by companies also making ingots. Figures for companies making steel only for castings are not included.

The report for 1934 includes for the first time the tonnage of hot rolled stainless steel and other alloy steel products, and figures showing the production of cold rolled sheets, cold rolled strip, cold drawn bars, drawn wire, barbed wire, and wire fencing and rolled steel car wheels.

The 1934 edition also contains certain information on investment, earnings, income, number of employes, wages and salaries, number of stockholders, etc. which has not appeared in previous issues.

Labor

NINETEEN rebel lodges of Amalgamated Association of Iron, Steel and Tin Workers were reinstated Aug. 7 by the International union. The lodges were expelled last February when they defied President Michael Tighe, later took their case to federal court and won. Full reinstatement will occur only after constitutional obligations of the 19 lodges have been fulfilled. This includes filing of quarterly reports which have lapsed and the payment of about $24,000 in back dues.

WAGE RATES AND EARNINGS DECLINE FASTER ABROAD

Competitive advantage of certain foreign countries over the United States in changes in wage levels since 1929 is cited by the National Industrial Conference board, New York. From 1929 to 1934 the general level of wage rates and earnings in Poland decreased 26 per cent, Germany 21, Italy 18, Belgium 14, Canada 11, Esthonia 10, and the United States only 1. The declines from 1929 to 1933 in Australia were 19 per cent, Hungary 16, Netherlands 11, Switzerland 3, and Sweden 2.

¶Atlas Drop Forge Co., Lansing, Mich., has adopted group insurance for its 260 employes through the Metropolitan Life Insurance Co.

First Half Scrap Exports Establish New Records

Exports of scrap iron and steel, says the commerce department's metals and minerals division, reached new heights in the first half of 1935 when shipments to overseas markets totaled 1,154,226 gross tons valued at $12,502,120. Shipments in the January-June period of 1934 had set a record at 738,848 tons, only to be topped by the 415,378-ton (56.4 per cent) increase registered by the 1935 trade. Included in the 1935 figure are 1,115,942 tons of iron and steel scrap valued at $11,258,327, tinplate scrap weighing 23,145 tons worth $494,747, and waste-waste tinplate to the amount of 15,139 tons valued at $749,046.

Comparing the two six months' periods, the trade with all save three markets to which shipments were made in both years increased from a few tons to the 316,654-ton gain registered in shipments to Japan, while eleven markets not traded with in the 1934 period were added to offset the four minor markets lost in 1935. In all twenty-eight markets have received some scrap directly from the

United States thus far in 1935, against twenty-one in 1934.

Japan, increasing her purchases 77.7 per cent, was the leading buyer of American scrap, her total of 724,246 tons including 696,646 tons of iron and steel scrap, 17,521 tons of tinplate scrap, and 10,079 tons of waste-waste tinplate. Next came Italy with takings increased 54.8 per cent, or to 145,925 tons, of which 3364 tons were of tinplate scrap. Trade in this commodity with the United Kingdom rose 71.1 per cent to 138,886 tons, of which 2726 tons were waste-waste tinplate, while that with Canada was greater by 22.2 per cent and amounted to 36,446 tons. Shipments to Poland, our fifth market, were sharply reduced at 22,361 tons, 60.3 per cent less than in 1934, but the 25,313-ton trade with Mexico represented a gain of 9003 tons (62.7 per cent), while the 19,470-ton trade with China was 20.7 per cent above that of the same period of last year.

Transportation

DIRECT expenditures of Class I railroads of the United States for fuel, supplies and materials during the first five months of 1935 totaled about $245,500,000, a decrease of $26,450,000 or 10 per cent, compared with the same period in 1934. On the other hand this is an increase of $89,900,000 or 37 per cent over five months of 1933. These figures do not include new cars and locomotives.

RAILROAD CREDIT CORP. PAYS

Railroad Credit Corp. has distributed $25,020,094 or 34 per cent of the fund administered by it, according to a report to the interstate commerce commission. The distribution of July 31 returned $735,885, equal to 1 per cent of the fund.

Carnegie Employes To Repay Company Relief

Approximately 3000 employes at Edgar Thomson works, Braddock, Pa., of Carnegie Steel Co. have agreed to pay debts to the company contracted from September, 1932, to July, 1933, for relief accounts. Bills cover supplies distributed on credit cards pledging repayment. Prior to September, 1932, direct relief was granted by the company without requesting repayment. The employes' contentions were that direct federal relief could have been obtained without obligation and asked last week that the debts be canceled.

The agreement ultimately reached was a compromise. Instead of the 5 and 10 per cent deductions the company had proposed it was agreed to allow employes to make repayment by giving $1 or $2 out of each pay envelope.

Institute's Statistical Report Shows Hot Rolled Alloy Production for First Time

PRODUCTION of hot rolled alloy steel products is reported in the annual statistical report of the American Iron and Steel institute for the first time in the issue for 1934. The figures are broken up to show the production of stainless steels and of alloy steels other than stainless.

The figures follow, in tons:

	Alloy other than stainless	Stainless	Total
Plates	25,167	1,560	26,728
Sheets and strip	92,181	17,076	109,257
Bars	478,350	8,870	487,220
Light structural shapes	155	.....	155
Rails	1,598	.....	1,598
Skelp and blanks or pierced billets	49,045	40	49,085
Wire rods	28,604	3,663	32,267
Blooms and billets for forging	75,836	2,448	78,284
All other	2,594	422	3,016
	753,531	34,079	787,610

For the first time the institute defines the steels which fall under alloy classifications. "Alloy steels other than stainless," reported in the first column of the table includes only steel where the minimum of the range specified in any of the elements named exceeds the following percentages: Nickel over 0.40 per cent; chromium over 0.30 per cent; copper over 0.50 per cent; manganese over 1.65 per cent; silicon over 0.50 per cent; molybdenum over 0.10 per cent; vanadium, tungsten, cobalt, titanium and zirconium, any per cent.

Stainless steels as shown in the second column of the table, include all steels (other than tool steels) containing 9 per cent or more of chromium, with or without other alloys, or a combined content of 18 per cent or more of chromium and other alloys.

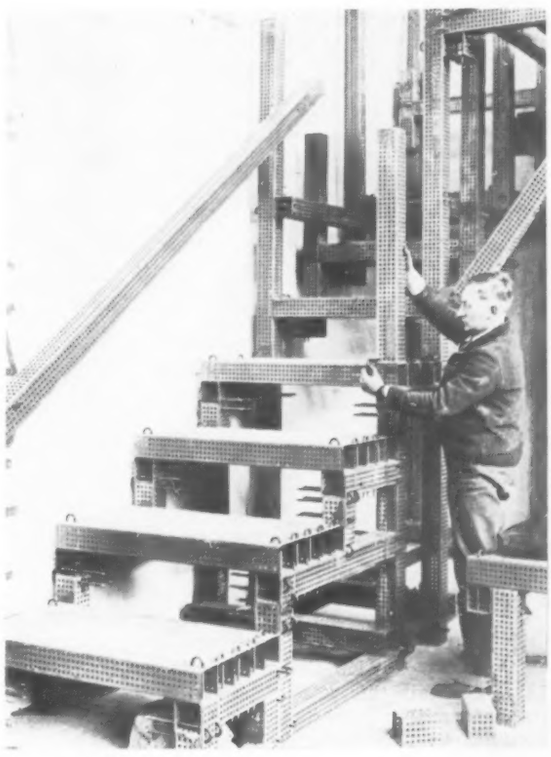
The first of the foregoing classifications also has been applied to the institute's statistics on the production of alloy ingots and castings.

Total output of alloy ingots and castings in 1934 is reported as 1,612,275 gross tons.

PWA

PRODUCERS of structural steel employed in grade crossing elimination work do not regard the present outlook hopefully. Recent efforts to have PWA regulations modified with respect to the limit for expenditures per man per year met with little success, it is said. Present regulations to a large extent preclude the use of

Man-Size Steel Blocks That Are Useful



By the use of these standard steel sections, the invention of Dr. J. G. Wattjes, of the Technical University at Delft, Holland, temporary stairs, tribunes, and even buildings may be erected. Note the special hooks for joining sections.
Wide World photo

materials other than reinforced concrete. The only promise for structural steel is largely on projects where the individual states can be relied upon to furnish a share of the funds. This prospect, it is reliably stated, is far from encouraging.

Rhode Island's action in voting down an $8,000,000 appropriation for PWA work in the recent election is regarded as a significant tip-off to the sentiment prevailing in many states, and particularly where it is being discovered that proposed projects under PWA regulations are proving far more costly than might normally be expected.

Production

FOR the fifth consecutive week, steelmaking showed an increase, rising 1 point last week to 48 per cent. Gains at Chicago, Wheeling, Cleveland, Birmingham and New England offset a 2-point loss at Youngstown and a slight decline at Detroit. Other districts were steady. Details for various districts follow.

Youngstown—Ingot output last week averaged 51 per cent, off 2 points. Tentative schedules indicate a rate of 51 per cent or fractionally higher at this week's opening.

Wheeling—Up 3 points to 79 per cent last week. Twenty-nine out of 37 open-hearth furnaces were active.

Detroit—Off 6 points last week to 88 per cent, with 15 of the district's 17 open-hearth furnaces operating. One district producer, which has had all of its furnaces operating, dropped one from the active list; the other producer has eight units melting.

Pittsburgh—Steady at 41 per cent. The leading independent locally operated last week at 46-48 per cent, a sizable increase, but the leading corporation subsidiary was unable to better the 30 per cent mark, and accordingly depressed the district's average.

Twenty-two steelworks blast furnaces out of 60 are now in blast here, a gain of one over a week ago. For this week there will be still another gain when Carnegie Steel Co. blows in a second Isabella furnace on ferromanganese.

During the past week Jones & Laughlin Steel Corp. resumed with a fourth Eliza furnace, making 7 of 11 on. Other individual blast furnace rates remain unchanged with Carnegie having 8 of 32 on, Bethlehem, 3 of 7, and American Steel & Wire, Pittsburgh Crucible Steel, and Pittsburgh Steel, each 1 of 2. National Tube Co. at McKeesport, Pa., has 1 of 4 operating.

Central eastern seaboard—Unchanged from preceding week at 31 to 32 per cent, with the probability of a slight gain this week. One eastern plate mill is expected to add an open hearth this week, bringing its total active units up to two. Finishing operations have expanded somewhat, with the Pencoyd, Pa., producer operating both its small and large mills.

Chicago—Rose 1 point to 53 per cent, highest rate in five months. Steelmaking is believed to be near its peak for the present, and mills regard a small letdown by the end of August as not unlikely. Most finishing mill operations are steady, while blast furnace schedules are unchanged with 13 of 36 steelworks stacks and two merchant units active.

Birmingham — Jumped 4 points last week to 35½ per cent, to meet increased demand. Eight open-hearth furnaces were in operation during the week. Probabilities are the new rate will be maintained for a while at least, if not increased shortly after the turn of this month.

New England — From the lowest point in more than two years, steel ingot operations advanced 20 points last week to 45 per cent and further gains are scheduled for this week. Two steelworks added open-hearth capacity and one of these will again lift operations this week.

Cleveland-Lorain — Up 8 points to 62 per cent, Corrigan, McKinney Steel Co. lighting two more open hearths to operate 11, and National Tube Co., Lorain, one more to operate nine. Otis Steel Co. continues with four.

Buffalo — Held at 37 per cent last week, with 14 open hearths in the district active.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended Aug. 10	Change	Same week 1934	Same week 1933
Pittsburgh	41	None	19	48
Chicago	53	+ 1	32	54
Eastern Pa.....	31½	None	22	42½
Youngstown..	51	— 2	38	64
Wheeling	79	+ 3	30	80
Cleveland	62	+ 8	32	79
Buffalo	37	None	34	58
Birmingham..	35½	+ 4	20	55
New England	45	+20	38	83
Detroit	88	— 6	77	55
	48	+ 1	27½	54

JAPAN STEEL OUTPUT GROWS

Japan registered an increase in production of steel and iron during the first five months of 1935 over the same period of 1934, according to a report to the department of commerce from Trade Commissioner P. P. Steintorf at Tokio. Pig iron production in the period was 1,120,843 metric tons, compared with 978,604 tons in five months of 1934, an increase of 14 per cent. Carbon steel output was 1,879,158 metric tons, an increase of 25 per cent over the 1934

Goes in Circles, yet Progresses

This welder appears to be doing an artistic job in high lights and shadows, but these frames will shortly be imbedded in concrete and be lost to sight as the means for conveying water from the Hetch Hetchy reservoir to San Francisco.
Wide World photo

figure. Steel products produced in this period totaled 1,501,949 metric tons, an increase of 27 per cent.

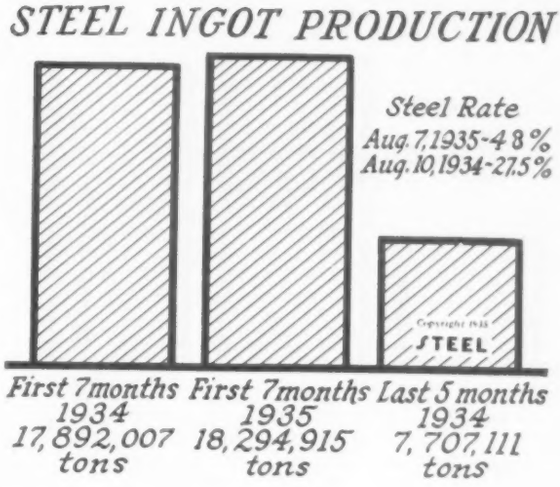
July Ingots Defy Usual Summer Drop

PRODUCTION of steel ingots in July fell off slightly from June, with a daily average of 87,316 gross tons, compared with 96,247 tons in June, according to the monthly compilation of the American Iron and Steel institute. The percentage of capacity occupied in July was 39.44, compared with 40.31 in June. Total calculated production in July was 2,270,224 gross tons, compared with 2,230,893 tons in June, the increased total being due to one more working day in July.

Compared with July, 1934, last month shows up well. In July, 1934, daily average production was 59,578 tons, with 27.06 per cent of capacity engaged, a total of 1,489,453 tons being produced. The fact that July of this year almost equaled June is unusual as a decided drop usually comes at the midyear, which was almost absent in this instance. In the last fifteen years July output has exceeded that of June only once, in 1933.

For seven months of 1935 total production was 18,294,915 gross tons, compared with 17,892,007 tons in the corresponding period of 1934; daily average 101,163 tons, compared with 94,339 tons in 1934; per cent of capacity occupied 45.69 compared with 44.79 in 1934.

STEEL ingot production in the first seven months this year was only 2.2 per cent larger than in the comparable period in 1934. In the last five months of 1934 the industry operated at an average of 27 per cent, and ingot output was only 7,707,111 tons. The significance of the chart is that the industry now has only to beat 27 per cent for the remainder of this year to come out ahead of 1934. Ingot production in the middle of last week was 48 per cent



Byers Adds Steel Pipe To Wrought Iron Line

A. M. Byers Co., in the wrought iron industry since 1864, has just annuonced the third major expansion project for this company in recent years.

Several years ago Byers completed the largest and most modern wrought iron mill in the country at Ambridge, Pa., for manufacturing wrought iron under a new process. Following this, operations were further expanded to include reintroduction of a wide range of wrought iron products, including plates, sheets, merchant bars, angles, structurals, and forging billets.

The third step was taken when J. Frederic Byers, chairman of the board, announced recently that steel pipe would be manufactured in addition to the present line of wrought iron products.

"The use of wrought iron pipe," says Mr. Byers, "for corrosive services in buildings, industrial plants, and underground lines, with steel pipe for practically all other piping requirements, materially broadens our markets. Our customers who buy steel pipe as well as wrought iron have suggested that we make a steel pipe which, within its field, would measure up to the same quality that we now enjoy in wrought iron. This development means that we can now offer our customers both wrought iron and steel pipe, thereby meeting more of their pipe requirements."

The Byers company is offering butt and lap weld pipe from ⅛ to 14-inch diameter.

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 97.91 per cent

	Open Hearth		Bessemer		Total		Calculated daily production, all companies (gross tons)	Number of working days
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity		
1935								
Jan.	2,631,673	49.73	239,858	34.99	2,871,531	48.04	106,353	27
Feb.	2,553,429	54.28	224,336	36.82	2,777,765	52.28	115,740	24
Mar.	2,637,331	51.75	230,810	34.97	2,868,141	49.83	110,313	26
Apr.	2,408,588	47.27	231,916	35.14	2,640,504	45.87	101,558	26
May	2,381,061	44.99	254,796	37.17	2,635,857	44.10	97,624	27
June	2,020,406	41.23	210,487	33.17	2,230,893	40,31	89,236	25
July	2,045,768	40.15	224,456	34.01	2,270,224	39.44	87,316	26
7 mo.	16,678,256	47.05	1,616,659	35.18	18,294,915	45.69	101,163	181
1934								
Jan.	1,824,640	34.69	172,489	25.17	1,997,129	33.59	73,968	27
Feb.	2,036,071	43.55	175,873	28.87	2,211,944	41.86	92,164	24
Mar.	2,594,536	49.33	203,904	29.75	2,798,440	47.07	103,646	27
Apr.	2,678,582	55.00	257,482	40.57	2,936,064	53.34	117,443	25
May	3,067,874	58.33	331,620	48.38	3,399,494	57.18	125,907	27
June	2,776,891	54.83	282,592	42.81	3,059,483	53.44	117,672	26
July	1,369,584	28.12	119,869	18.89	1,489,453	27.06	59,578	25
7 mo.	16,348,178	46.26	1,543,829	33.49	17,892,007	44.79	94,339	181
Aug.	1,271,752	24.18	109,598	15.99	1,381,350	23.24	51,161	27
Sept.	1,151,362	23.64	117,615	18.53	1,268,977	23.05	50,759	25
Oct.	1,354,113	25.75	127,789	18.64	1,481,902	24.93	54,885	27
Nov.	1,478,566	29.19	132,059	20.01	1,610,625	28.13	61,947	26
Dec.	1,832,790	37.63	131,467	20.72	1,964,257	35,68	78,570	25
Total	23,436,761	38.68	2,162,357	27.39	25,599,118	37.38	82,312	311

Capacity percentages for 1935 are based upon open-hearth capacity of 60,954,717 tons and bessemer of 7,895,000 tons on Dec. 31, 1934; for 1934 based on open-hearth capacity of 60,583,813 tons and bessemer of 7,895,000 tons on Dec. 31, 1933

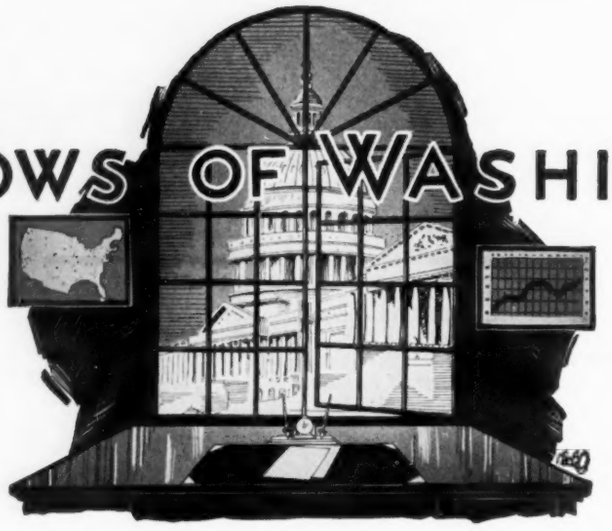
Merger

FOLLOWING the decision of the department of justice at Washington not to appeal its action against the merger of Republic Steel Corp., and Corrigan, McKinney Steel Co., these companies have continued to get in proxies from stockholders, which was stopped when the government filed suit Feb. 7.

At that time it was announced that proxies had been received for 65 per cent of the preferred stock and two-thirds of the common stock affected by the proposed merger. Though these were more than sufficient to ratify, efforts are being made to obtain as many as possible.

No obstacle now stands in the way of the merger, and that it will be consummated as speedily as possible was indicated last week, when routine financial details were being arranged. Stockholders are expected to be called together shortly. Steps toward the acquisition of Truscon Steel Co., it is understood, will not be taken until the merger is formally completed.

WINDOWS OF WASHINGTON



WASHINGTON

APPARENTLY considerable sentiment is developing in government and other circles for depreciation allowances for machinery and equipment in income tax returns.

Allowances granted in Great Britain were recently pointed out in this column and now comes an interesting unofficial report from Germany much to the same effect, showing what is being done there. In addition to the government American machine tool manufacturers are understood to be much interested in the subject.

It is understood that two measures have been enacted by the German government recently granting special depreciation allowances for machinery and equipment, one being a temporary measure and the other an integral part of the income tax law.

One of these laws provided that investments made after June 1, 1933, and before January 1, 1935, for equipment replacements of machinery apparatus and similar articles of industrial and agricultural capital equipment could be deducted in full in the year in which they were acquired or manufactured in the case of income, corporation and trade taxes, under certain specified conditions.

Some interesting unofficial suggestions have been made in the United States by those who have this subject very much at heart to promote plant modernization and assistance to the heavy goods industries.

Included in possible suggestions for a congressional bill along this line is the provision that a company could take advantage of this method of depreciation voluntarily. The idea is put forward that such a provision should prevail for a definite period, as for instance heavy equipment actually purchased on or before December 31, 1936, with reasonable completion time thereafter to be specified.

Such a bill should specify new machinery and plant equipment only, excluding second hand equipment. An optional provision should be made to deduct expenditures from income for the year for new purchases in the year that the money is actually expended.

Suggestion is made also that for each machine amortized an old similar machine in use should be scrapped. The deduction should be allowed on purchases directly or indirectly made from American manufacturers employing labor in America in the building. It is believed that if this option is exercised future depreciation should not be allowed on the same equipment.

It is contended that the bill should also empower the commissioner of internal revenue, with the approval of the secretary of the treasury, to prescribe regulations governing deductions.

ICKES BERATES BETHLEHEM; FOREIGN STEEL RULE STANDS

Just as Washington representatives of the steel industry thought that the 15 per cent PWA differential matter had been properly buried—anyhow for the time being—Secretary Ickes broke out into his second tirade against the steel industry at a press conference last week, with especial reference to the Bethlehem Steel Corp.

PWA's order of May 26 allowing a 15 per cent differential for domestic made steel will stand, he stated, denying reports that the order might be modified to permit rather than compel borrowers of PWA funds to buy foreign materials for public works if the cost of domestic materials exceeds foreign bids by more than the prescribed 15 per cent differential.

It was quite evident that Secretary Ickes had been "primed" for his statement—because unquestionably he would not have had the information on the tip of his tongue which he rolled off without any difficulty with regard to the business of the Bethlehem corporation.

The secretary charged that Bethlehem is one of the largest importers of iron ore in the United States and that it uses foreign ships with foreign crews. He said also that Bethlehem uses imported manganese almost exclusively and that it has a long-time lease on two ore-carrying foreign built ships.

"These ships," he stated, "were built in Germany. They are operated with Swedish crews. The names of the ships are the AMERIKALAND and the SVEALAND. The Bethlehem company is the one that is always after legislation for an American owned merchant marine, manned by American crews. It owns shipyards in Baltimore, Boston and San Francisco."

It was suggested at the conference that the American supply of manganese cannot meet the demand of the steel companies. "I suppose there is a shortage of American sailors, too," he replied.

Until Eugene G. Grace made his recent New York statement relative to the 15 per cent differential, it is understood that Horatio B. Hackett, assistant PWA administrator, was favorably disposed to modify the order and he would have so recommended. Threat of foreign competition in the public works program was temporarily removed last week when German sheet piling interests failed to submit an expected bid on the Miami, Fla., dock job covered by a PWA loan.

WALSH BILL IS CALLED SUBTERFUGE FOR NRA

New Dealers, Brain Trusters and other backers of the President have been having a grand scrap behind the scenes in connection with the Walsh government contract bill.

This is the bill, it will be recalled, for which the President asked some

time ago, and which would provide that contractors for the government would have to stick to the hours and wages of their old NRA codes.

The bill has caused all kinds of controversy, especially among government purchase officers who have had long years of service and who see in any such law a long line of troubles of one kind or another. Predictions are being freely made here now that congress will adjourn without this bill being enacted and the further away this bill is put off for passage the less chance there is that it will be passed.

The National Association of Manufacturers has referred to the bill as "nothing more nor less than an administration sponsored effort to do by indirection what the Supreme Court said in the poultry case could not be done directly under the constitution."

"Under this measure," the association says further, "every bidder on government contracts, every subcontractor, every supplier of material, every borrower of funds from any of the numerous government lending agencies and many other classes of citizens would be subjected to absolute control of federal bureaucracy as to wages, hours, and other working conditions."

COAL MINING BILL NOW HELD UNWORKABLE BY NEW DEALERS

Considerable difference of opinion is still evident among even the New Dealers relative to the Guffey coal bill. Its constitutionality has been questioned from the day of its introduction and doubt has been increased by recent court decisions.

There are said to be equally important questions of practicality. Experience under NRA apparently justifies the question as to the possibility of policing prices of so vast an industry.

One of the provisions of the bill requires the use of average weighted costs of an area as the basis of prices for all mines in that area, regardless of the physical nature of the seams and quality of the coal. It is contended by many that this appears entirely unworkable.

As is well known the proposed measure would impose a code on the coal industry, require collective bargaining provisions in accordance with provisions of the recovery act and attempt to coerce the industry by levying a confiscatory tax on the products of the mines which are said not to conform to its requirements.

INDUSTRY SHY OF FTC

There is a noticeable tendency, particularly in the case of some larger industrial groups, to defer final decision on the advisability of resorting to the trade practice conference, pending a clarification by the federal trade commission of its views toward open prices and other matters which were formerly the subject of NRA code provisions.

In spite of early intimations of liberality in the treatment of voluntary agreements covering competitive practices, recent announcements by the commission furnish little evidence of any pronounced change in its attitude toward such agreements.

The commission has recently restated its views respecting the distinction between groups one and two of the trade practice rules. So far as now appears, the commission's present attitude on the classification of these rules follows closely the policy which has prevailed since this practice was first established some ten years ago.

SENATE BILL BACKED BY A.F.L. TO REGULATE BUSINESS

A bill known as the federal corporation licensing act has been introduced in the upper house of congress by Senator O'Mahoney of Wyoming which would rigidly regulate American business. The bill, which was originally written by the A. F. of L., has the backing of that body but it has been materially changed since written. Its purpose is to replace NRA and, of course, while no action will be taken at the present session of congress, it will be on the calendar when congress gets back into action in January.

Briefly the bill includes the licensing of all industries in interstate commerce and limits dividends that can be paid to stockholders by any corporation. Administration of the law would be placed in the hands of the federal trade commission. It would increase the membership of that body from five to nine persons.

Those who drafted the bill have put in it a guarantee of the right of collective bargaining and prohibition of child labor and discrimination against women in industry.

Senator O'Mahoney stated that the bill was drafted following conferences with Charlton Ogburn, counsel for the A. F. of L., representatives of the federal trade commission and other government bureaus and individuals.

William Green, discussing the bill, stated that "we regard this measure as of outstanding importance. It has been given the approval and support of the American Federation of Labor."

O'LEARY LIKES BANKING BILL

John W. O'Leary, president of the machinery and allied products institute, describes section 303 of the pending Glass-Steagall banking bill as "like a rainbow in the sky" in its promise to aid the nation's capital goods industries on the way to economic recovery.

"This section of the new banking bill," said Mr. O'Leary, "would make it possible for the durable goods industries, where the overwhelming bulk of unemployment now is concentrated, to seek and obtain private investment funds with which to finance the greatest volume of needed work that ever faced the United States in times of peace."

Mr. O'Leary said that "as an instance of the potential opportunity now facing durable goods industries, it will be recalled that a recent survey by the institute disclosed a total of approximately $18,500,000,000 in replacement orders for machinery and equipment dammed up during the depression.

"If durable goods is given the opportunity to obtain the private financing it needs, the huge volume of potential work now before it can be financed and the 5,000,000 unemployed workers within those industries will be afforded a reasonable prospect of going back to work."

GERMAN DUMPING IS CLAIMED

Complaint has been made to the customs bureau, treasury department, that Germany is dumping ferromanganese on the American market. It is understood the complaint did not contain enough details and unless these are forthcoming no investigation will be undertaken.

Information at the department of commerce shows that during 1934 only 79 tons of ferromanganese was imported from Germany. On the other hand, during June this year, 630 tons was imported. No reason can be assigned for this tremendous increase in imports which probably led to the filing of the complaint.

LACK RUSSIAN TRADE FIGURES

The government here has little information available as to how the new Russian trade agreement is working out. It is pointed out, however, that among the leading exports to Soviet Russia last year were included black steel sheets, pipe and fittings, metal grinding machines, and various kinds of machine tools.

Statement was made at the time the treaty was signed that Russia would spend some $30,000,000 in the United States during the coming twelve months. Figures at the department of commerce show that during the years 1932-34, it spent an average of $12,000,000 a year here; in 1929-31, $99,000,000; 1926-28, $62,000,000; and 1923-25, $39,000,000 as an average per year.

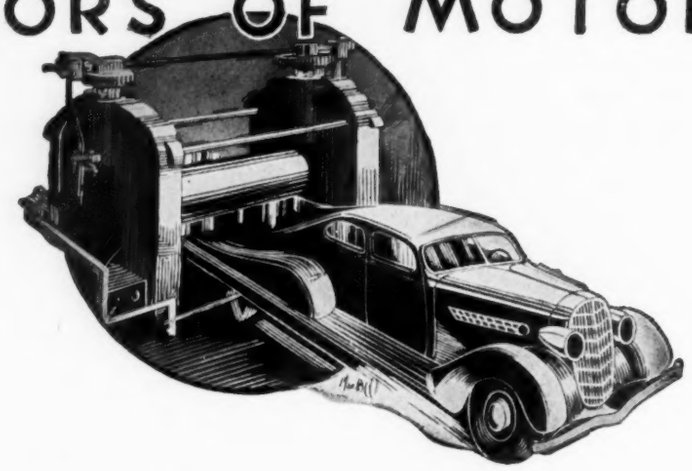
PRESIDENT FILLS VACANCIES

Ernest G. Draper, New York, has been nominated by President Roosevelt for assistant secretary of commerce in place of John Dickinson, who recently resigned to become the assistant attorney general in charge of antitrust prosecutions. The appointment has been confirmed by the senate.

At the same time the President

(*Please turn to Page* 85)

MIRRORS OF MOTORDOM



DETROIT

FIRST half profits in the automobile industry were gratifying—so much so that motor car builders are taking extraordinary pains to see that the good financial showing thus far accumulated is not spoiled by confusion and delay in the shifting from 1935 to 1936 models.

Profits for six months, such as the $18,000,000 reported by Chrysler, the $79,000,000 credited to General Motors, and the unquestionably large unknown net earned by Ford, might easily tempt the industry's leaders into a false sense of security. However, there is every indication that the high executives of motordom are guarding against any such mistake as this. Close observers believe that the industry is making a determined effort to prove that it can stand prosperity.

One evidence of this is the extent to which the leading builders are trying to preserve every possible opportunity in the current strong retail market. Everything possible is being done to avoid breaking the chain of good demand through costly delays in the changeover.

Avoiding Major Changes

Builders do not see the wisdom of dissipating their profits on costly and extensive redesign on power plants or other major items. The industry has not forgotten the trouble which Ford encountered in changing to the V-8 motor a few years ago, nor the difficulties which Chevrolet experienced in adapting its models to the knee-action spring assembly last year. In both cases the finished cars were held off the market long enough to affect sales adversely. The industry does not want to encounter such delays in the present period of change.

Therefore, such major mechanical changes as rear engine mounting, motor or frame changes, etc., probably will have to wait for another year. As one observer puts it, "next year's cars will be 'sheet metal' changes. These changes will be superficial. They will be in hoods, radiators and fenders." Also, it is almost certain that the amount of tool and die shop work will be considerably less than in recent years.

Just for example: Chevrolet, Olds, Pontiac and others, while they will have new radiator, hood, and rear fender designs, will in the final analysis be mechanically the same as at present. Superficially, such changes make for interesting new appearances, but from a manufacturing problem they don't take long to work out. Plymouth is another committed to this policy.

More Hydraulic Brakes

The motor car producer must make the public conscious of new cars, and he must make the 1935 car look passe. He must do so with spending as little money for the purpose—and certainly as little time—as in any of the last five years.

One major exception can be taken to the foregoing, and that concerns braking. General Motors—and likely Ford—have shown indications of swinging around to hydraulics. It's likely that Chevrolet and Buick will have them, thus making the General Motors family consistent on this feature.

Hydraulics can thank the new style fenders for their rise to popularity. Were it not for these "tin pants" it isn't likely that mechanical brakes would have to give so much ground in the last few years.

Small wheel sizes and tire diameters also have had much to do with the problem. Brake drums, which are regarded as brake heat radiators, more and more have been hidden from air currents (that would cool them) by the new vogue in protective fenders, plus the large tire and the small wheel.

Another point for hydraulics lies in increasing motor speeds. Brake authorities say that instead of braking being requisite on a 50-50 basis, over the two fronts as against the rear wheels, the ratio now is something like 60-40, and the fronts need the heavier share. They go on to say that hydraulics afford a more accurately proportioned and more nicely adjusted brake torque within these percentage limits.

So, don't be surprised when the New York show rolls around in November—only 60 days hence—that if you apply a tape measure to the glistening new models, you find specifications turn out to be pretty close to the present. Incidentally, spaces have been allotted already for the New York show.

There will be considerable dolling up by a more liberal use of brighter metals, including stainless. Radiator curves promise to be different. Wire wheels are out. As always, there will be numerous changes in gadgets. But hydraulic braking promises to be the one and only costly mechanical deviation.

Out at Chrysler there has been a recent decision against the one-piece steel top. Certain factions in Chrysler were working for a point to meet General Motors' "turret top" idea, but practicability has forced them to retract.

Shy Away from Top Dies

The biggest drawback was in getting a die made that would do the trick. A Detroit die shop took nine months to perfect the 79-ton die it made for Fisher and said, when approached by Chrysler, "never again." The job taxed crane, shipping, and all handling facilities, as well as profits and made the die makers cautious.

With the result that Chrysler will, of course, stay with the steel body idea it pioneered but will have to resign itself to the fact that it can't do the top job in one stamping operation.

At Hudson, installation of a lot of new welders recently indicates that that motor maker will approach the steel top manufacturing problem from another angle. Several welding

innovations are promised. Panels will be assembled along a different procedure.

Ford continues to play with the all-steel top idea and has had a number of them made by hand and put through exhaustive tests at Rouge. But, there's nothing yet to indicate conclusively that the idea will be taken up 100 per cent on next year's V-8's.

Because Rouge assembly lines were down last week the total assembly figure for the industry was reduced sharply. Chevrolet ran off between 25,000 and 26,000 jobs for the last week, Plymouth about 8000, Dodge, 5000 and Olds, 4000. Closely following were Pontiac at 3100, then Packard at 1500, and Hudson with 1200. Outside of Detroit, Nash at 2000 for the week and Studebaker wtih 1000 assemblies, were bright spots.

This morning, Aug. 12, the Ford contingent troops back to work, following a ten-day respite. Late last week workers were issued cards instructing them to return and the majority of the Rouge office force is again back at desks.

Some Ford departments, such as the sheet metal division, worked uninterruptedly the last ten days. There were other departments where forces were maintained to balance inventories, but the large part of 80,000-odd employes took a layoff.

Start New Ford Coke Ovens

Following the 32,000-ton sheet and strip purchase by Ford two weeks ago, deliveries on which began even through the vacation, the assembly of V-8's will resume virtually where it left off.

By last week, excavation had begun at Rouge on Ford's two new batteries of coke ovens. Steel piling is being sunk 90 feet to hard-pan. The ovens ought to be ready to produce by next summer.

Usually, the Chevrolet divisions take vacations along this time of the year or in September. But business being what it is, the layoffs will be only of necessity and confined to a few days.

For instance, Chevrolet will take a short time to balance itself at Flint, Saginaw, at Gear & Axle and other divisions. Last week the company figured it had 100,000 models more to produce before it swings over into the 1936 lines. It will take all of August and a part of September to do it. Vacations will be sandwiched in wherever possible.

Packard is in the same fix. It had originally set Aug. 10 to 26 as the layoff period, but the 120 is so strongly supported by sales that 275 to 300 a day were coming off the lines last week and the odds favor tempering the length of vacation. Late last week releases for parts on 2200 more were issued for over the last half of August.

Incidentally, Packard, with 21,000 of the 120's out on the roads, expects to have paid for all expenses incident to tooling by the time 30,000 are out. Packard will stand on this model for next year, barring a couple of fender changes and a revision in door swinging.

The surprise Packard has had with this middle-priced car has stirred the imagination of others in the "quality" field. A faction at Cadillac never was won over two years ago to the straight eight for a cheapened La-Salle. Detroit recently has learned that a small V-8 will be sprung by Cadillac in the Packard 120 price range, doubtless in time for November shows.

Ford's small 12-cylinder Lincoln is nearer to reality. After working on this model for over a year, during which time it was dropped and revived on several occasions, it looks like September is going to be the announcement date.

Preparing for Busy Year

Detroit motor plants have been buying new heating and annealing furnaces, conveying systems, etc. A number of unused or even obsolete departments are being swept out and painted. The signs of the times point to expectations of a heavy 1936.

Most of the car builders have bought steel by now to take care of them for the rest of the third quarter. Fisher has been a heavy purchaser, Ford has completed all details on a buy of 32,000-odd tons of flat-rolled steel and Hudson is tabulating the bids it received until Aug. 1 on some 125 new sheet sizes and 50-odd new strip sizes designated for 1936 models.

Sometime after Aug. 20 the first big relases for new models should come through. Steel should be in transit by Labor day; through September it will be fabricated in the motor plants. The finished cars will emerge—if all goes well—by Oct. 1. So runs the present schedule.

Chrysler has been announcing new parts' contracts for 1936. Last week, Electric Auto-Lite at Toledo, which has most of the Chrysler electrical work under contract, bought Alemite Die Casting & Mfg. Co., Chicago and Woodstock, Ill. The latter has received substantial contracts for Chrysler Corp. die castings.

New Process Gear Corp., Syracuse, N. Y., has a contract valued at $1,500,000 for Plymouth and Dodge rear-end assembly carriers in 1936. Not long ago, Midland Steel Products, adjacent to Plymouth's Mt. Elliott plant, got the latter's frame business for next year.

The Detroit die shops may not have been as busy as in former years, but their output of former years is taking a new twist. Detroit is full of stories about Russia, through Autostroy, being a hot tip as a buyer of old American dies.

Usually, the motor plants keep their old body dies for about three years, then sell them. Frequently, they go for their scrap value, but this year Autostroy established a buying agent in Detroit and has taken a lot of old dies off the market.

Thumbs Down on Processing Tax

Not only on the agreement for advancing the introduction of new models has the automobile industry run afoul of the new deal. Following the recent court decision in Boston unfavorable to the processing tax of AAA, automobile manufacturers are notifying suppliers of carpets, seat pads and other cotton products that they will not pay the processing tax any longer. This puts the suppliers on the spot, as the tax is paid by previous processors and passed along to them, but now the automobile industry refuses to requite them for it.

A Detroit interest is soliciting steel users to employ its pickling service, offering to accept in-bound shipments, pickle and deliver for a flat charge of $1.50 a ton within the Detroit switching area . . . Union drop forge workers in the Detroit-Toledo-Cleveland area have set up a Great Lakes council, expecting to speak also for union die makers, blacksmiths, pattern makers, molders, etc. in future negotiations . . . Automobile manufacturers are closely watching labor developments in connection with the late August convention of the Automobile Workers' union, an A. F. of L. affiliate, and Father Coughlin's proposed rally of automobile workers Labor Day . . . . Continental Motors Corp. threatens to close its Detroit plant unless an adjustment is made on its taxes the past three years.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115.272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,320
July	229,357	264,933	*340,000
7 Mo.	1,219,471	1,979,196	*2,602,144
Aug.	232,855	234,811	.....
Sept.	191,800	170,007	.....
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

July 27	82,894
Aug. 6	69,415
Aug. 13	48,067

Industrial Men in the Day's News

Alexander L. Feild, Professor of Metallurgy, Carnegie Institute of Technology

Building up a noteworthy department on the melting and refining of steel is his objective.

He comes to his new post from the Rustless Iron Corp. of America and the Alloy Research Corp.

Previous connections include Union Carbide, Central Alloy Steel and Simonds Saw & Steel.

ALEXANDER L. FEILD, consulting engineer for the Rustless Iron Corp. of America and president of the Alloy Research Corp., has been appointed professor of metallurgy at the Carnegie Institute of Technology, Pittsburgh. He will assume his new duties in September.

Professor Feild brings to Carnegie Tech much practical experience in the metallurgical industry as well as a thorough knowledge of the science of process metallurgy. He has successfully developed several processes for the melting and refining of steels, particularly alloy steels, which have become of great importance in the steel industry.

The new Tech professor received his training at the University of North Carolina and North Carolina State. When he takes over his duties at Tech, he will be working only a stone's throw from the bureau of mines building where for four years, from 1914 to 1918, he served as junior physical chemist and later as assistant metallurgist.

He left Pittsburgh in 1918 to become research metallurgist with the Union Carbide & Carbon Corp., until 1925, when he went to Canton, O., as research engineer for the Central Alloy Steel Co. After two years there he returned to the Union Carbide & Carbon Corp.

From 1929 until 1931 he was research engineer with the Simonds Saw & Steel Co., Fitchburg, Mass., and from 1931 until the present he has held a consulting position with the Rustless Iron Corp. in New York city and has been president of the Alloy Research Corp. of Baltimore and New York.

Professor Feild has published numerous articles in technical journals on the melting and refining of steel, and he has taken an active part in the affairs of the metallurgical societies. He will devote his attention at Tech to the melting and refining of steel with the object of building up a prominent department in this subject.

♦ ♦ ♦

William J. Hammond, since 1926 traffic manager for the Inland Steel Co., Chicago, has been appointed vice president in charge of railroad sales, succeeding Charles R. Robinson, recently made first vice president and general manager of sales. Mr. Hammond began his career in 1901 with the Illinois Central railroad, advancing to contracting freight agent in 1911 when he left for a similar position with the Union Pacific railroad. Later he was appointed eastern car service agent for the latter company and in 1918 was named assistant traffic manager for Inland Steel.

Ralph R. Flynn, assistant traffic manager for Inland since 1926, and associated with the traffic department since 1912, has been appointed traffic manager, succeeding Mr. Hammond.

William J. Hammond

J. G. Carruthers

Who as noted in STEEL for Aug. 5 has been appointed special representative for the Bethlehem Steel Co., at the general offices in Bethlehem, Pa.

♦ ♦ ♦

Col. J. S. Ervin, president of Mackintosh-Hemphill Co., Pittsburgh, sailed for England Aug. 2 to discuss plans for the use of American-designed machinery in the current expansion of metalworking plants and steel mills in Europe.

He was accompanied by F. H. Moyer, vice president in charge of engineering, and H. V. Blaxter, chairman of the Mackintosh board. Executives of companies in England, France, Germany, Belgium and Russia are to meet with the Mackintosh representatives in London.

♦ ♦ ♦

S. Howard Eisenberg has been appointed sales engineer and representative in Colorado, Utah, Wyoming and western Nebraska for Foote

Gear Works Inc., Cicero, Ill. His headquarters will be at 1367 Marion street, Denver.

♦ ♦ ♦

Harry E. Berger has been named general purchasing agent of the York Ice Machinery Corp., York, Pa., succeeding the late Earle Gardner. Mr. Berger started with the York company in 1903 as a stenographer, and from 1906 to 1918 served in the sales department. Since 1918 he has been assistant purchasing agent.

♦ ♦ ♦

John M. Davie has been appointed exclusive district representative for sales of flexible power presses and shaft straightening attachments by the General Mfg. Co., Detroit. With headquarters at 224 South Michigan avenue, Chicago, his territory includes northern Indiana, Illinois, Wisconsin and Iowa.

♦ ♦ ♦

Charles J. Roberts has been appointed assistant general manager of the Four Wheel Drive Auto Co., Clintonville, Wis. For six years he was manager of the industries and trade promotion divisions of the Milwaukee Association of Commerce. Previous connections included A. O. Smith Corp., Gisholt Machine Co. and Nash Motors Co.

Anthes Awarded Penton Medal

MAJ. LAWRENCE LEE ANTHES has been announced 1935 recipient of the John A. Penton gold medal of the American Foundrymen's association, in recognition of distinguished service to the foundry industry of America. Presentation will be made at the association's annual dinner, to be held at the Royal York hotel, Toronto, Ont., during the week of the thirty-ninth annual A.F.A. convention, Aug. 19-23.

Major Anthes long has been actively connected with the work of the A.F.A., having served as vice president in 1906-1907 and as president in 1908- 1909. In addition, he has served on many committees and on the board of directors.

Born in Toronto, he entered the service of the Toronto Foundry Co. in 1896, joining his father in the manufacture of cast iron soil pipe and fittings. In 1899 he left the foundry business temporarily to enter the field of journalism, but rejoined the Toronto Foundry Co. Ltd. in 1902 as superintendent. Name of this company was changed to Anthes Foundry Ltd. in 1908. Major Anthes became managing director and secretary-treasurer in 1914 upon the death of his father.

During the World war period he

Harry E. Berger

was connected with the Canadian expeditionary forces from 1916 to 1918. He was appointed director of the demobilization branch of the department of soldiers' civil re-establishment in November, 1918, continuing in this capacity until June, 1920.

Since then he has devoted his time to various industrial and civic organizations. In addition to his position as president of Anthes Foundry, which he assumed in 1933, he is chairman of the board of Anthes-Tait Foundry Ltd., Vancouver, B.C., president of Imperial Iron Corp Ltd., St. Catharines, and president of Lennox Furnace Co. of Canada Ltd.

Major Anthes served as chairman of the industrial relations committee, Canadian Manufacturers' association, 1932-1933, as vice president the same year and as president in 1933-34. He is now first vice president, National Construction council of Canada, and a member of the advisory board of the Canadian Construction association. The past year he has served as vice president and chairman of the constitutional committee of the Canadian Institute of Plumbing and Heating.

The Penton medal of the A.F.A. was established in 1920 by John A. Penton, chairman of the board, Penton Publishing Co., Cleveland, and is awarded at intervals of several years.

Maj. Lawrence Lee Anthes

Died:

ROBERT M. KILGORE, 58, district sales manager at New York for Jones & Laughlin Steel Corp., Pittsburgh, in New York, Aug. 7. Born in Pittsburgh, for a number of years he was in charge of the Jones & Laughlin Cleveland office. He had been a member of the American Iron and Steel Institute since 1921.

♦ ♦ ♦

Thomas S. Stanton, 47, president of the Southern Boiler & Tank Works, Memphis, Tenn., Aug. 1.

♦ ♦ ♦

Jacob Weisberg, 76, retired owner of the Broadway Machinery Co., Cincinnati, in that city, Aug. 7.

♦ ♦ ♦

L. P. Byrd, 78, president of the Mt. Gilead Brick Co., Mt. Gilead, N. C., Aug. 1, in an automobile accident.

♦ ♦ ♦

Robert S. Crawford, 78, former Tennessee Coal Iron & Railroad Co. engineer in Birmingham, Ala., Aug. 3.

♦ ♦ ♦

Oscar E. Reddy, district manager for Fletcher Machinery Co., Atlanta, Ga., textile machinery manufacturer, in an automobile accident, July 27.

♦ ♦ ♦

Alexander P. Morrow, 80, retired head of the Willis-Morrow Mfg. Co., Elmira, N. Y., subsidiary of the Willis-Overland Co., in Elmira, Aug. 5. Early in his career he was general manager of the Eclipse Machine Co., Elmira.

♦ ♦ ♦

Dr. Arthur D. Little, 71, prominent industrial chemist and founder of the Cambridge, Mass., testing laboratory of Arthur D. Little Inc., in Northeast Harbor, Me., Aug. 2. He had specialized for many years in the chemistry of cellulose, gas and petroleum.

♦ ♦ ♦

James R. Campbell, 58, chief chemist of H. C. Frick Coke Co., Pittsburgh, for 20 years and at the time of his death associated with the Island Creek Coal Co., in Scottdale, Pa.,

(*Please turn to Page 85*)

Activities of Steel Users and Makers

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh Pa., has contracts from the board of transportation, New York, for equipment for its 500 subway cars recently placed. The contracts aggregate more than $2,000,000. The equipment includes 190-horsepower traction motors, multiple-unit control for operation of eight to ten-unit trains, battery charging panels and car ventilating fans. More than 2000 fans of ceiling mounted type are included. Production will be started at once and installed as fast as cars are completed, to give early use of the new vehicles. Cars are being built by Pressed Steel Car Co., Pittsburgh, Pullman-Standard Car Mfg. Co., Chicago, and American Car & Foundry Co., New York.

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Peninsular Steel Co. has established a warehouse at 1915 Spielbusch avenue, Toledo, O., with George E. Reminger as manager. Stock will be carried of Bethlehem and Swedish tool and die steels, high speed and alloy steels.

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Henry H. Adams & Co. Inc., New York, representing the Colonial Iron Co. Inc., Riddlesburg, Pa., producer of pig iron and dealer in coal and coke, has moved its New York offices from 289 Madison avenue to 140 Liberty street.

♦ ♦ ♦

Air Reduction Sales Co., Lincoln building, New York, has moved its welding supply service from Third and Glisan streets to larger quarters at 13 Northwest Fourth avenue, Portland, Oreg.; to meet substantial growth of business in Atlanta, Ga., and Tulsa, Okla., this company has opened a store at 336 Spring street, N. W., Atlanta, and 18 North Cheyenne avenue, Tulsa. At each store equipment, gas and electric supplies will be carried in stock.

♦ ♦ ♦

Trabon Engineering Corp., manufacturer of lubricating equipment, has moved its manufacturing plant from Detroit to East Fortieth street at Kelly avenue, Cleveland. Some changes have been made in the organization and the officers now are: President, treasurer and general manager, E. J. Hull; vice president, J. N. Fauver, president, J. N. Fauver Co., Detroit; secretary, Alvord L. Bishop. William A. Chapman, formerly with Lukens Steel Co., represents the company in the Pittsburgh district. Louis H. Hein Inc., Philadelphia, is in charge of the company's Atlantic coast business aside from Greater New York, which will be handled by Fink, Dumont & White, New York. The F. J. Johnson Co., Cleveland, represents the company in Ohio and the Chicago districts, while the Michigan territory is handled by the J. N. Fauver Co.

♦ ♦ ♦

Greer Steel Co., of Dover, O., definitely has decided not to build a large strip mill on a 45-acre site it had bought of Butler university in Anderson, Ind., because construction engineers, on preliminary work, encountered 30 feet of quicksand at a 10-foot level throughout the site. Another tract will be investigated for a site, it was announced.

June Exports Gain By Aid of Scrap

IRON and steel exports from the United States in June, totaling 289,687 tons, set a modern record for that month and for the first time in five years exceeded the May volume, according to figures compiled by the metals and minerals division of the department of commerce. Invariably in past years the June export total has been 10 to 20 per cent below that of May. June exports this year were about 10 per cent higher than in June, 1934.

For the first six months of 1935 total exports of steel and iron products were 1,595,934 tons, an increase of 27 per cent over the total of 1,253,174 tons in six months of 1934. Car wheels and axles made a gain of 520 per cent in the first six months, semifinished steel 202.8 per cent, scrap 56.5 per cent, hot-rolled strip steel 52.5 per cent and black sheets 25.6 per cent.

Japan Still Large Buyer

June exports of scrap, 215,098 tons, formed the largest item. Japan took by far the largest portion, 139,955 tons, followed by Italy with 26,271 tons, United Kingdom 22,825 tons, Canada 7664 tons, Poland and Danzig 5491 tons and China 3416 tons. Exports of black steel sheets were 9711 tons, of which Canada took 4191 tons and Mexico 1688 tons. Iron ore shipments were 43,297 tons, all going to Canada, which in May took 111,565 tons.

While the export situation on the basis of total tonnage shows a gain, the picture is somewhat less rosy when scrap tonnage is excluded. The tremendous tonnage of scrap moving in recent months and years has tended to obscure the trend of trade in products on which labor has been expended, which have given employment to workers.

Thus with scrap omitted other steel products exported in June totaled 74,589 tons and in May 77,174 tons, a decline of 3.3 per cent. For six months of 1935 exports exclusive of scrap were 479,992 tons and in the same period of 1934 they were 514,322 tons, a decline of 6.6 per cent.

This showing indicaes that the usual falling away of June from May is in effect as regards manufactured exports, the situation being disguised by the unusual situation in scrap.

Detailed statistics of steel and iron imports into the United States in June were presented last week (STEEL, Aug. 5, page 26).

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	June, 1935	May, 1935	Jan. thru June, '35
Pig iron	417	248	1,421
Ferromanganese and speigeleisen	1	1	35
Iron and steel scrap	215,098	209,425	1,115,942
Tin plate scrap	2,973	6,583	23,145
Waste-waste tin plate	2,584	4,941	15,139
Ingots, blooms, etc	1,778	1,675	28,280
Bars, iron	53	124	614
Bars, steel	3,645	4,364	25,917
Bars, alloy steel	1,148	164	1,180
Wire rods	2,368	1,150	11,162
Boiler plate	130	179	626
Other plate, not fab.	2,749	2,709	17,706
Skelp, iron or steel	530	2,724	6,766
Iron sheets, galv.	99	111	723
Steel sheets, galv.	6,391	7,445	37,872
Steel sheets, black	9,711	9,363	53,370
Iron sheets, black	382	653	2,936
Strip steel, cold-rolled	1,311	1,406	8,818
Strip steel, hot-rolled	1,862	2,102	12,514
Tin plate, taggers' tin	7,160	7,349	53,695
Terne plate	161	175	1,357
Tanks, except lined	442	413	2,992
Shapes, not fab.	2,520	2,699	14,915
Shapes, fabricated	2,490	1,084	9,414
Plates, fabricated	92	73	838
Metal lath	62	83	361
Frames, sashes and sheet piling	210	927	3,129
Rails, 50 lbs. and over	5,933	1,533	17,034
Rails, under 50 lbs.	675	584	2,137
Rail fastenings	702	208	2,603
Switches, frogs, crsgs.	104	104	643
Railroad spikes	172	183	1,308
Railroad bolts, nuts	33	49	243
Boiler tubes, seamless	311	1,307	4,445
Boiler tubes, welded	17	97	334
Casing and oil-line pipe, seamless	1,262	1,001	11,475
Same, welded	94	21	3,507
Seamless black pipe, other than casing, etc.	160	143	1,684
Malleable iron screwed pipe fittings	245	287	1,590
Cast iron screwed pipe fittings	334	156	953
Cast iron press. pipe and fittings for	598	1,005	4,471
Cast iron soil pipe and fittings for	297	185	1,965
Welded black steel pipe	941	968	9,335
Welded black wrought iron pipe	139	146	1,323
Welded galv. steel pipe	1,074	1,190	9,828
Welded galv. wrought iron pipe	80	107	524
Riveted iron or steel pipe and fittings	27	70	246
Plain iron or steel wire	1,598	1,162	7,818
Galvanized wire	2,766	1,893	10,861
Barbed wire	2,535	1,992	14,701
Woven wire fencing	177	130	877
Woven wire screen cloth	119	83	514
Wire rope	414	296	2,208
Other wire and mfrs.	335	364	2,457
Wire nails	644	688	4,871
Horseshoe nails	50	33	320
Tacks	40	29	202
Other nails, staples	160	212	1,262
Bolts, machine screws	430	595	3,268
Iron castings	685	697	4,391
Steel castings	152	161	1,257
Car wheels and axles	495	380	11,407
Horseshoes	33	1	100
Iron and steel forgings, n. e. s.	489	369	2,905
Total gross tons	289,687	286,599	1,595,934

EDITORIAL

Merger Will Revive Interest In Distribution Problems

APPROVAL last Monday of a plan to merge Inland Steel Co. and Joseph T. Ryerson & Son, Inc. is an important step in the development of effective merchandising in the iron and steel industry.

The union of the largest independent warehouse with the successful, aggressive independent steel producer will stimulate among all companies a renewed, intensive interest in the distribution of iron and steel products. In the extent that it arouses an enlightened consciousness of the importance of intelligence merchandising in an industry which has been handicapped by a production complex, the Inland-Ryerson hookup is bound to have a salutary effect.

Every producer of iron and steel products—whether rolled, cast, forged, stamped or fabricated— has a potential market consisting of a few large buyers and a large number of small consumers. The proportion of so-called "tonnage" or "big" customers differs for each product. In finished rolled steel, where large automobile companies, railroads, carbuilders, tin can manufacturers, etc. take a large part of the output, the proportion going to large customers is high. At the last meeting of the American Steel Warehouse association, Walter S. Doxsey, executive secretary, estimated that 42 per cent of the rolled steel produced is taken by less than 100 consumers. The remaining 58 per cent goes to a great number of small consumers in miscellaneous industries. He estimated that 21.4 per cent of this 58 per cent consumed in the general trade is sold through warehouses. Moreover, whereas the number of mill customers probably does not exceed 15,000, the buyers from jobbers total about 192,000.

Steelmakers—Traditionally Tonnage Minded—Are Prone To Underrate Small Orders

Steelmakers, bound somewhat by the glorious traditions of the past, still are prone to give undue attention to the "tonnage" customers. Probably an order for 10,000 tons from General Motors, Chrysler or Ford looks more attractive than 100 orders of 100 tons each from smaller companies. Again there is a strong temptation to give more attention to the buyers who take 100 tons at a time than to those whose purchases range from several tons to a hundred pounds.

To devise a system of sales and distribution which will fit such a complicated structure of large and small consumers admittedly is a difficult problem. Able and experienced executives have devoted years of intensive study and effort to the subject. Yet it is doubtful whether they can agree as to what point in the descending scale of size of orders establishes the dividing line between mill sales and warehouse sales. Nor is there unanimity of opinion as to the many other factors, other than size of order, which determine whether sales and distribution should be handled by the mill or through jobbers.

In spite of the apparent confusion on these points, it is reasonable to hope that the next decade will witness a marked improvement in the merchandising of steel. Certain trends already are discernible. On the one hand is a continued movement toward larger units of "big" consumers. The steel industry is meeting this situation by matching the mass production operations of the "tonnage" customers with mass production methods (continuous mills) in its own establishments.

Trend of Industrial Development Points Toward More Diversified Distribution

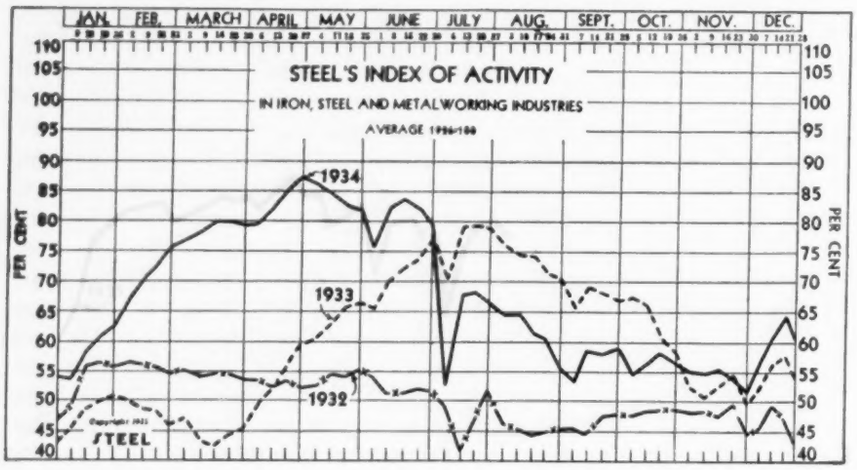
On the other hand is a trend toward a greater consumption of steel by miscellaneous industries and through more diversified channels of distribution. No one can predict how this will affect the methods of supplying iron and steel products, but the indications point to a much greater dependence upon jobbers and warehouses.

For instance, consider the use of steel in residence construction. If this market is as important potentially as experts declare it to be, its development will exert a strong influence on merchandising methods. That influence probably will be in the direction of distribution of steel products in smaller amounts and through distributors scattered widely geographically.

Also, the development of new steels, many of which are designed for specific, limited applications, will tend to pull down the average weight of steel per sale. The more widespread use of welding as a means of fabricating has brought new customers to the steel industry, and many of them purchase in small quantities.

Jobbers are the advanced outposts of the distribution system of the steel industry. Almost every new consumer is a warehouse customer before he acquires the status of a mill customer. For this reason, if for no other, steel producers should make sure that they are not underestimating the importance of jobber distribution.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined 2.4 points to 78.4 in the week ending August 3:*

Week ending	1935	1934	1933	193
June 1	71.9	75.7	65.3	51.0
June 8	79.3	82.3	69.9	51.1
June 15	80.0	83.6	72.1	51.8
June 22	77.3	81.8	73.9	51.3
June 29	78.4	79.4	77.0	49.2
July 6	64.1	52.3	71.4	41.7
July 13	76.5	67.8	79.1	46.7
July 20	79.8	68.1	79.4	
July 27	80.8†	66.4	78.8	
Aug. 3	78.4*	64.6	75.9	45.1

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

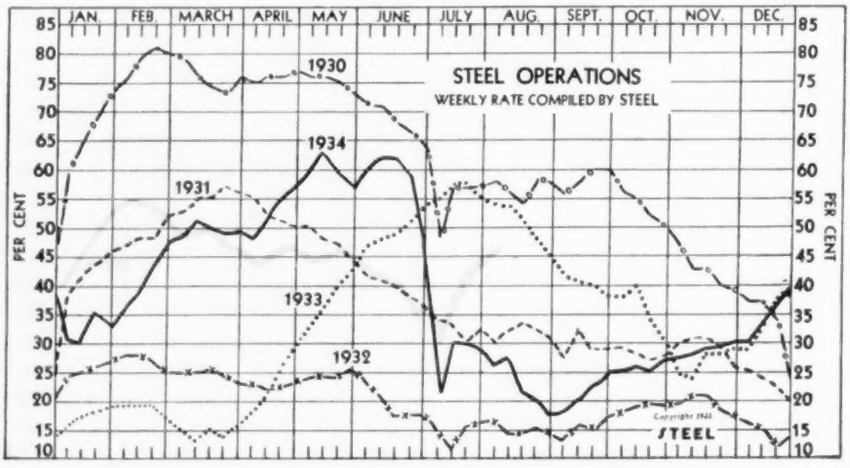
Index Points to Temporary Easing of Activity

AVERAGE activity in the metalworking industries, as measured by STEEL'S index, was down moderately in the week ending Aug. 3. The expected decline was due largely to curtailed operations in the automobile industry, which on July 26 began to ease its schedules for the usual inventory period. Assemblies dropped from 82,894 in the week ending July 27 to 69,415 in the week ending Aug. 3. This decline of 13,479, while much less than had been expected, more than offset the gains in activity in other branches of the metalworking industries.

Another factor partly responsible for the relapse in the activity index is the sluggishness of revenue freight car loadings. Considering the sharp pickup in many industries since Independence day, it was reasonable to expect an encouraging increase in freight traffic. Instead the gain in the four weeks of July, was almost negligible and the figures for the week ending Aug. 3 probably will show an actual decline from the previous week.

Electric power output continues at almost unprecedentedly high volume, with the gains over last year's figures being well distributed geographically. Steelworks operations mounted two points to 47 per cent of capacity, due again to miscellaneous demand from many consuming industries.

Current trends now point to a mild slackening of pace, probably of short duration. A sideways movement during several weeks in August should be followed by a resumption of the upward trend late in August or early in September. At that time the expanding activity in automobiles and freight traffic should more than wipe out the traces of the present lapse.



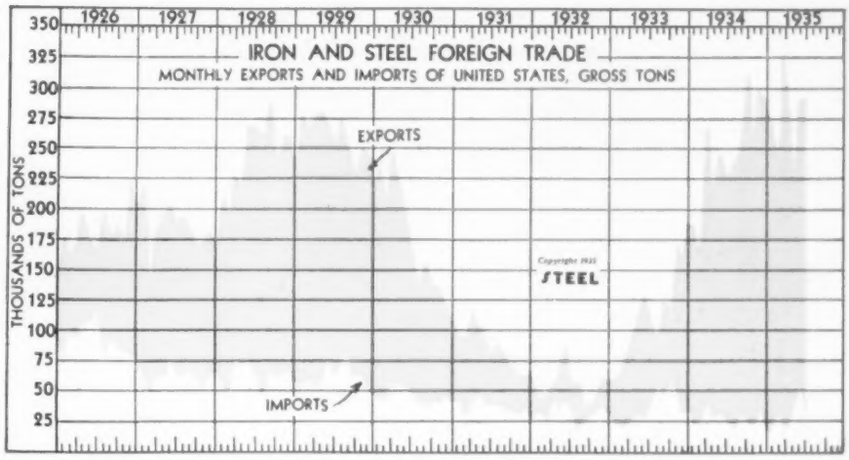
1935 Per Cent	
Aug. 3	47
July 27	45
July 20	43
July 13	38
July 6	31
June 29	37
June 22	35.5
June 15	39
June 8	41
June 1	42.5
May 25	44
May 18	44.5

1934 Per Cent	
Aug. 4	26.5
July 28	29.5
July 21	30
July 14	30
July 7	22
June 30	46
June 23	59
June 16	62
June 9	62
June 2	60
May 26	57
May 19	59

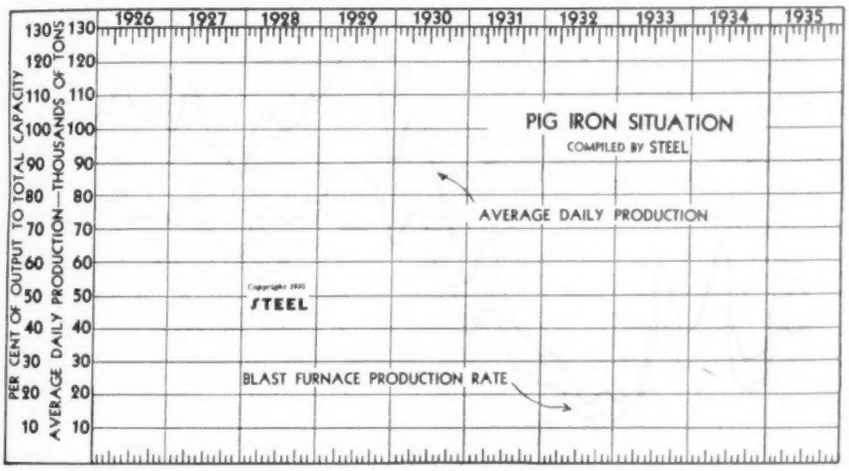
June Steel Imports Register Sharp Loss

Gross Tons

	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,260
April	28,866	205,336	26,862	201,539
May	47,719	286,598	29,465	241,753
June	33,208	289,687	24,848	219,406
July	.....	.....	17,676	233,186
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764



Iron Production Drops Slightly in July

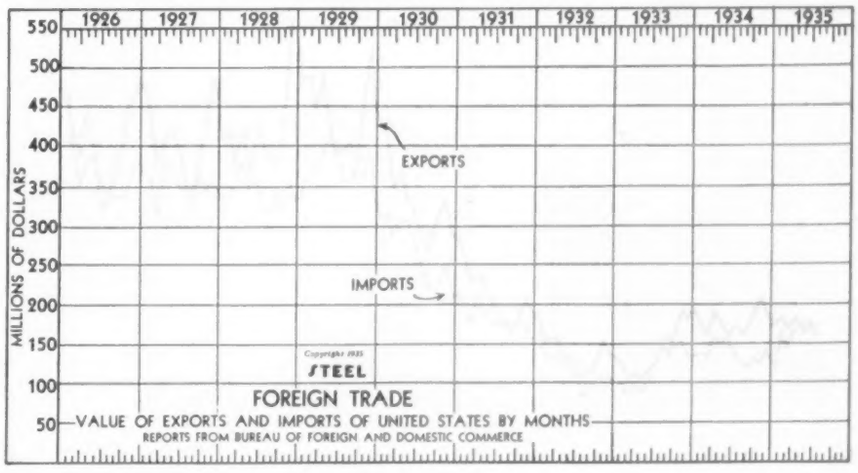


	Daily Average		Blast Furnace Rate	
	1935	1934	1935	1934
Jan.	47,692	39,537	34.2	28.3
Feb.	57,686	45,385	41.4	32.5
Mar.	57,120	52,438	41.0	37.5
April	55,719	57,873	40.0	41.4
May	55,986	66,370	40.2	47.5
June	51,949	64,563	37.2	46.3
July	49,033	39,630	35.2	28.4
Aug.	.....	34,199	.....	24.5
Sept.	.....	29,969	.....	21.5
Oct.	.....	30,689	.....	22.1
Nov.	.....	31,930	.....	23.3
Dec.	.....	33,161	.....	23.7

Merchandise Exports Advance Slightly in June

Dollars (000 omitted)

	1935		1934	
	Exports	Imports	Exports	Imports
Jan.	176,223	166,993	169,531	128,536
Feb.	163,006	152,537	159,671	125,292
March	185,603	177,279	190,000	158,000
April	164,350	170,567	179,427	146,523
May	165,457	170,207	160,207	154,647
June	170,193	156,756	167,957	135,048
July	.....	.....	161,787	127,342
Aug.	.....	.....	171,965	119,516
Sept.	.....	.....	191,690	131,659
Oct.	.....	.....	203,622	137,859
Nov.	.....	.....	194,909	150,919
Dec.	.....	.....	170,676	132,252



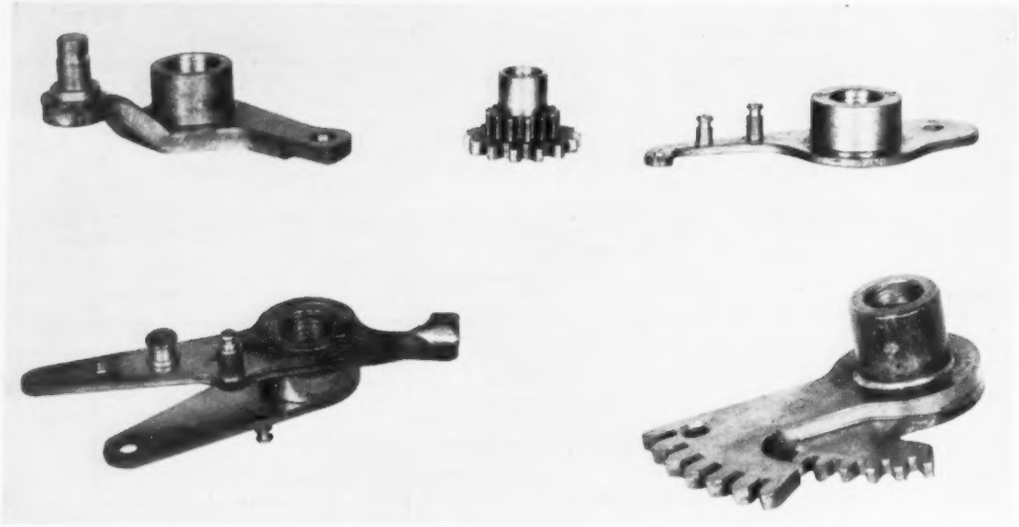


FIG. 1 — Subassembly for cash registers. These parts, formerly drilled and pinned, now are joined by brazing in the electric furnace

Metals Are Brazed in Controlled

Part I

USE of controlled atmospheres in joining of metals can be traced back to two accidents which happened in the research laboratory shortly after the turn of the century. Perhaps these are the earliest events to demonstrate possibilities of the process.

In one experiment, tungstic oxide was being reduced in an iron tube. The powder was contained in a copper boat, and hydrogen was being passed through the tube for reduction of the oxide. At one point the temperature got beyond control, and the copper boat melted. Upon later examination it was found that the copper had wetted the surfaces of the reduced tungsten and the iron tube, and had formed a strong, firm bond between the two metals. Another similar accident showed copper to wet and flow long distances on iron wires used as a supporting grid for some tungsten filaments being treated in hydrogen.

Later, when our laboratory was developing gasoline engine ignition coil contacts, it was found difficult to join the tungsten buttons satisfactorily to the steel fingers, until someone remembered the first accident just mentioned. Soon thereafter, tungsten contacts became the first application of copper brazing in controlled-atmosphere electric furnaces.

THE accompanying article constitutes the first part of a paper presented at the Tri-Chapter meeting of the Dayton, Columbus and Cincinnati chapters of the American Society for Metals held in Dayton, O., April 15. Part II will appear in an early issue of STEEL. *The author, H. M. Webber, is associated with the industrial department, General Electric Co., Schenectady, N. Y.*

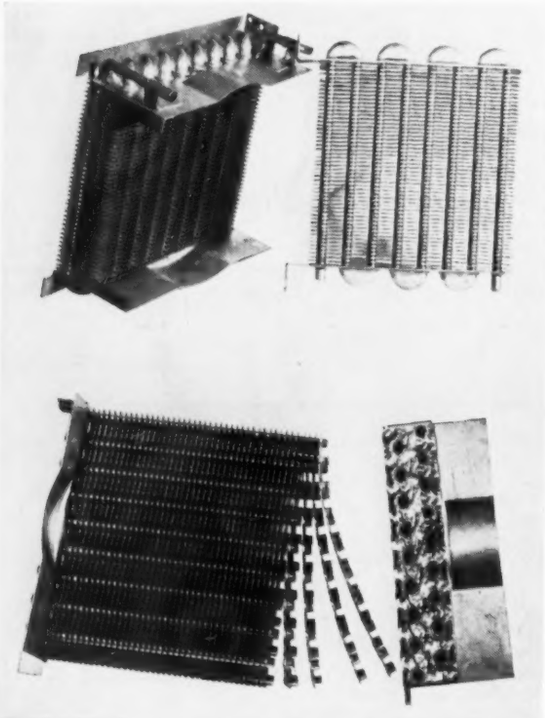


FIG. 2—Here are shown copper brazed steel-fin refrigerator condensers. Built up from stampings without the use of tubing except for connectors, these condensers withstand exceptionally high temperatures and internal pressures

Process Is About 25 Years Old

From this point on, use of the process began to grow. One of the early applications of copper brazing was in the manufacture of steel golf club shafts. In the early 1920's, turbine diaphragms and turbine diaphragm nozzle rings were successfully copper brazed in production, for which the development of large bell-type or three-stage furnaces was necessary. In 1926 the General Electric refrigerator was introduced,

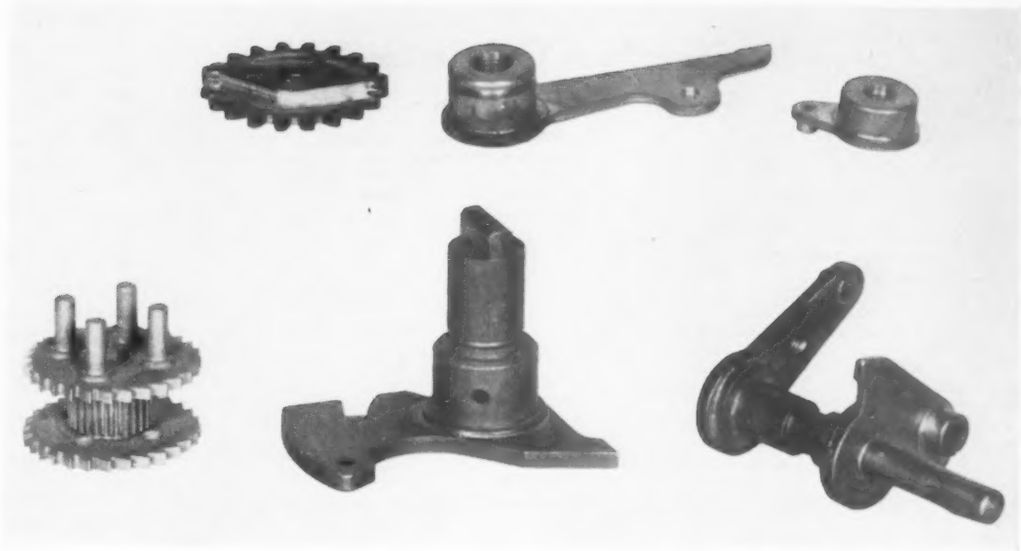


FIG. 3. — Copper brazed parts for adding and accounting machines. Copper wire rings placed near the joints supply the brazing metal

Atmosphere Electric Furnaces

BY H. M. WEBBER
General Electric Co.

in which there were six copper-brazed parts. This required development of very large brazing furnaces of the continuous type. By 1930, the General Electric Co. had in its several factories 16 large copper-brazing furnaces, rated from 90 to 400 kilowatts.

In recent years the electric furnace brazing process has been adopted by other manufacturers, until now the number of outside installations exceeds those built for our own factories. Marked improvements in quality and sizable reductions in cost have resulted in the use of the process for manufacture of various products such as double-walled steel tubing, tungsten-carbide alloy tools, steel-fin condensers, and parts for cash registers, computing machines, sewing machines, automobiles, refrigerators, and the like.

In this process, parts to be united are passed through an electric furnace in which a reducing atmosphere accomplishes the same result as a flux. There, the brazing metals applied during assembly in either solid or paste form, melt and flow into all joints by the aid of capillary attraction, and form alloys with the body metals. Then, on transfer of the work to the cooling chamber, these alloys solidify and the parts come out of the furnace with firm, strong bonds and clean, bright surfaces.

Fig. 1 shows some steel parts for cash registers, copper brazed by the National Cash Register Co., Dayton,

Fig. 4—A large variety of parts for industrial sewing machines are joined together by electric furnace brazing. Operating at high speeds, many of these parts are subjected to severe vibration

Comparative Strengths of Cash Register Parts

Pinned or Riveted Versus Electric Furnace Brazed

Name of Part	Ultimate tensile strength, pounds per square inch: Pinned or riveted	Copper brazed	Increase by brazing, per cent
Special counter drive pitman	1200	1820	52
Check ejector gear	190	310	63
Carrying sector spring bail	370	650	75
Switch lock lever	365	760	108
Transfer lever shaft	51	120	135
Compression roll shaft bracket No. 3	1010	2720	147
Counter engaging cam	675	1670	147
Motor bar plate	540	1440	167
Counter shifting segment	740	2100	184
Compression roll shaft bracket No. 2	590	2090	255
Check ejector arm	420	1500	257
Printer segment	310	1200	287

Tests made by Oswald and Homan, National Cash Register Co.

O. This company has adapted the process to the manufacture of over 300 different assemblies which formerly were riveted or pinned. The results are such that the parts have much greater strength, materially longer life, and both production and service costs have been reduced considerably.

Formerly, three or four small holes were drilled into each of these assemblies and steel pins were driven in place to lock the parts together. Now the component parts are simply pressed together, then swaged at the joints to assure tight fits and to retain indexing. Copper wire rings are applied near the various joints either during or after assembly, and the parts are passed through a box-type brazing furnace on trays, or they are carried through a mesh-belt conveyor-type furnace in which the parts rest directly on a heat-resisting belt made of alloy wire. Parts come from the furnaces clean and bright, ready for assembly in the machines. Illustrations of the furnaces will be shown later.

Strengths Are Increased

Comparative strength tests have been made on cash register parts to determine relative strengths obtained by the old and new methods. The data in the accompanying table are typical. Note that ultimate strengths of assemblies formerly pinned or riveted, now electric furnace brazed with copper, have been increased 52 to 287 per cent. This means that the parts have longer life—they do not work loose in service; they can be built with lighter and smaller sections, thus reducing inertia and space requirements; and, incidentally, they cost less.

The copper-brazed cash register parts withstand repeated impacts better than those pinned or riveted together. For example, in a severe accelerated test which gave 800 blows per minute on a certain assembly, feather-pinned levers had an average life of 1,400,000 operations. On a copper-brazed lever, the test was stopped after four times that number of operations as there was no sign of failure.

Cost savings effected by use of the electric furnace brazing process run in general from 30 to 90 per cent of the former costs when drilling and pinning the cash-register assemblies. Actual savings vary from $0.40 to $10.00 per hundred pieces.

How Costs Are Reduced

The parts shown in Fig. 3 are made for adding machines and Powers accounting machines by Remington-Rand Inc., at Norwood, O. In the assembly at the lower left, the ratchets are simply pressed over the hub ends of the gear, then a swaging operation fixes them tightly together. Studs are riveted into one of the ratchets prior to this general assembly. Placing of small copper wire rings near the joints completes the preparation for brazing. Formerly the ratchets were stake pinned to the hub shoulders of the gear, but the process was costly and the parts occasionally worked loose in service. These and many other subassemblies now electric furnace brazed by Remington-Rand, have greater strength, greater durability, lower costs than similar parts made by other methods.

In addition to the two business-machine manufacturers just named, there are two others in this same field who are using the electric furnace brazing process with success.

Sewing Machine Parts Brazed

The Union Special Machine Co., Chicago, maker of industrial sewing machines, cut production costs and improved parts like those illustrated in Fig. 4 with electric furnace brazing. Its machines are run at unusually high speeds—5000 to 6000 stitches per minute—and vibration frequently worked loose some of the assemblies fabricated by former methods.

In making the part *A*, Fig 4, the cross bars formerly were riveted into the punching. Now they are both riveted and copper brazed. The result is strong, vibration-resisting joints, fewer shut downs of machines for repairs and lower service costs. The bevel gear and shaft *B*, formerly was cut from solid bar stock. Now small gears are simply pressed on the shafts and electric-furnace brazed, saving time and money in machining. Sim-

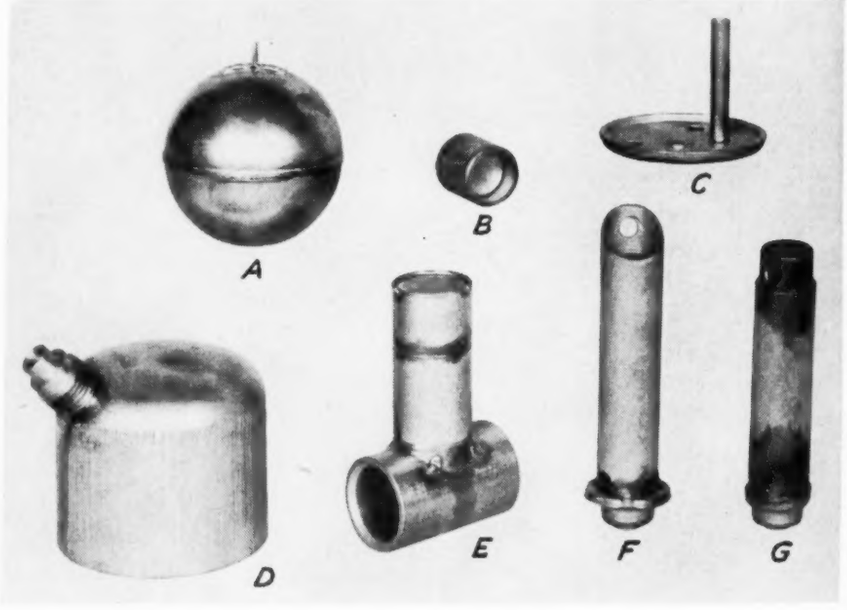


Fig. 5—Seven parts of the General Electric refrigerator are copper brazed in the electric furnace. They are designated as follows: A, the float; B, the unloader; C, the by-pass plate; D, the float chamber; E, the hollow piston; F, the intake muffler for the compressor; and G, the exhaust muffler. The assembly of these parts preparatory to brazing is shown in Fig. 6

ilar savings are made on the shaft and flange, *C*; it too was formerly machined from solid stock.

Assembly *D*, Fig. 4, was formerly torch brazed, which resulted in nonuniform results and high rejections. The parts had to be cleaned up after brazing, which was an expense. With the present method of electric furnace brazing, the parts are uniformly strong, clean, and bright, and worth-while savings have been made in both time and money through complete elimination of service failures. The parts shown in Fig. 4 are only a few of those being electric furnace brazed in the plant of the Union Special Machine Co., but they are typical.

Assembly Is Complicated

Fig. 2 shows copper brazed steel-fin condensers for refrigerators. The fins are cupped and punched from strip steel, and the stampings are then pressed together, forming tubes within themselves. No tubing is used in these units except for the two short connectors on one end. Copper wires placed inside the built-up tubes, and copper plating on the strip steel used for the fins, provide the supply of brazing metal. Assemblies of this construction up to 12 feet long, with a large number of joints, are electric furnace brazed without a single leak. The most common lengths of these units are about 1 or 2 feet. Condensers of this type are built to withstand exceptionally high temperatures and internal pressures.

A most highly successful and unusual application of electric furnace brazing is in the manufacture of double-walled steel tubing produced by Bundy Tubing Co., Detroit. The widest market for this tubing is in the automobile industry, where it is used for gasoline lines, oil lines, gage lines, and hydraulic brake lines. Refrigeration is another field. The wide acceptance of this product is a result of its high strength, its great resistance to vibration, and its low cost.

Use Copper Plated Strip

The tubing is formed by laterally rolling copper-plated steel strip into a double-walled structure as shown in Fig. 7, then pulling it through alloy tubes in an electric furnace, where the walls of the tubing are welded together never to separate. Each furnace accommodates 30 strands, and produces an average of about 100,000 feet of tubing daily in sizes varying from 3/16 to ⅝-inch outside diameter. Six of these furnaces, each rated about 150 kilowatts, run 24 hours a day in continuous production.

The General Electric refrigerator has seven electric-furnace brazed parts, shown in Fig. 5 in the order named: *A*, the float; *B*, the unloader; *C*, the by-pass plate; *D*, the float chamber; *E*, the hollow piston; *F*, the intake muffler for the compressor; and *G*, the exhaust muffler. In general, the parts are made of inexpensive stampings and pieces of steel tubing illustrated by the sectional sketches in Fig. 8. Although the assemblies are of the highest quality, their cost is quite low. In the comparatively few machines returned to the factory for servicing, failure of one of the copper-brazed parts is practically unknown. Thus the good strength afforded by the copper-brazed joints results in long life of the assemblies.

(To Be Concluded)

Fig. 7—Enlarged section of double-walled steel tubing made by copper brazing. Size of this tubing varies from 3/16 to ⅝-inch outside diameter

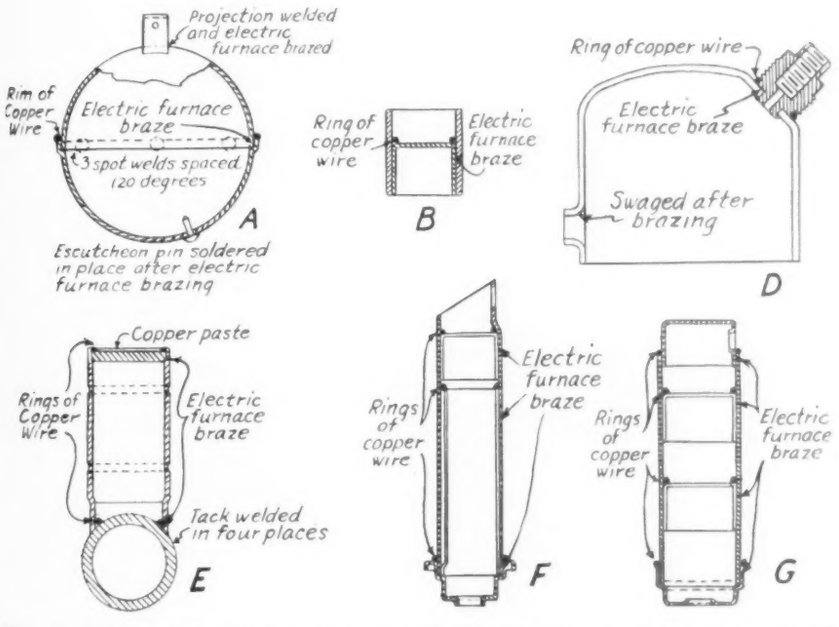


Fig. 6—These sketches show the detailed construction of six of the seven electric refrigerator parts illustrated in Fig. 5. The letter designations in the two illustrations correspond. In general, the parts are made up of inexpensive stampings and pieces of steel tubing joined securely by copper brazing. In some cases, the assemblies are spot or tack welded together before brazing

Tankless Hydraulic Lift Has Two Elevating Rams

Ottawa Mfg. Co. Ottawa, Kans., has developed a tankless hydraulic line of 2-post lifts for elevating automobiles and trucks in service stations and garages. In the new lift the company has combined both semi- and full automatic action in one unit.

It also has added newly patented features. One of these is an automatic air purging arrangement by which air pockets in the air line are given free outlet. Another is an oil passage or safety port which controls the upward and downward movements and positively prevents falling of the lift while raised.

The new tankless hydraulic lift operates with less air pressure and is said to have 32 per cent greater power. Several advantages are claimed for the 2-post design. It gives greater bearing surface and reduces binding action when the car's weight is not balanced on the lift. It prevents rotation of the lift, eliminating the possibility of accidents from this cause. With two rams, the superstructure is better supported.

Of steel construction throughout, the new lift has pistons of heavy seamless tubing, turned, ground and polished to mirror finish. Cylinders are of still heavier seamless steel tubing and welded together in six different places. Box type headers which support the superstructures are held to the piston flanges by ⅝ x 2-inch cap screws, eight for each piston. Superstructures are of two types. The drive-on type is fabricated from steel plate. The type which bears up against the car's axles so as to allow the wheels to turn freely is made from steel I-beams.

Use of Color Control Effects Efficient Job Scheduling

BY JOHN A. HONEGGER

A RECENT article from the British Isles made considerable mention of the innovation of color control for the operation of machine tools. It was contended, that an operator would respond much more rapidly to color signals than to numerical or literal characters. In line with this reasoning, the machine tool manufacturer not only selected colors but symbols representative of railroad signals, such as semaphores in various angular position, to represent the different feed and speed controls on the machine.

That a person will respond more quickly and is more capable of grasping a situation at a glance when color signals are employed, can be testified to by the writer from an experience he had a year or so ago in a special machine contracting shop in central Pennslyvania. This plant employing some 150 men specialized in intricate stocking knitting machinery, which required the production of many small parts in variable quantities to meet service requirements. In addition to manufacturing its own line of knitting machinery, the plant was called upon to build various types of special machines which the industry required from time to time.

Job's Exact Condition Revealed

When the writer made the first survey of the scheduling method employed, he found it to be a sort of catch-as-catch-can proposition. All orders for any processing whatsoever were dumped indiscriminately into the lap of the superintendent of the plant, and by some magical or superhuman process of divination, he was supposed to see that all these orders were brought through on schedule time, without the assistance of any other medium than a memorandum book.

A check-up was made immediately of the company's orders for a year back. This disclosed that the average length of time an order remained in the shop was 30 days, and the maximum time was 60 days. From this same source it was also determined which of the orders had been of rush nature, which orders could jog through the plant at a fairly uniform rate, and which could be considered in the category of fill-in orders.

With this data in hand, a color control system of scheduling was developed as shown in the accompanying illustration. The basis of the method is very simple, but very effective, in that it instantly calls to the attention of anyone concerned the exact condition of the job, its exact location, and its urgency. Should interferences occur it will also show these in terse concrete form for everyone to read. All of these are very important and necessary factors in the success of smooth scheduling of work through a plant.

At the very start of the system, orders were broken into three distinct groups, patterned after railroad scheduling.

Orders Scheduled in Three Groups

The first group, symbolized by the color red, were orders which must go through the plant with the least possible delay. These orders were called "express" orders.

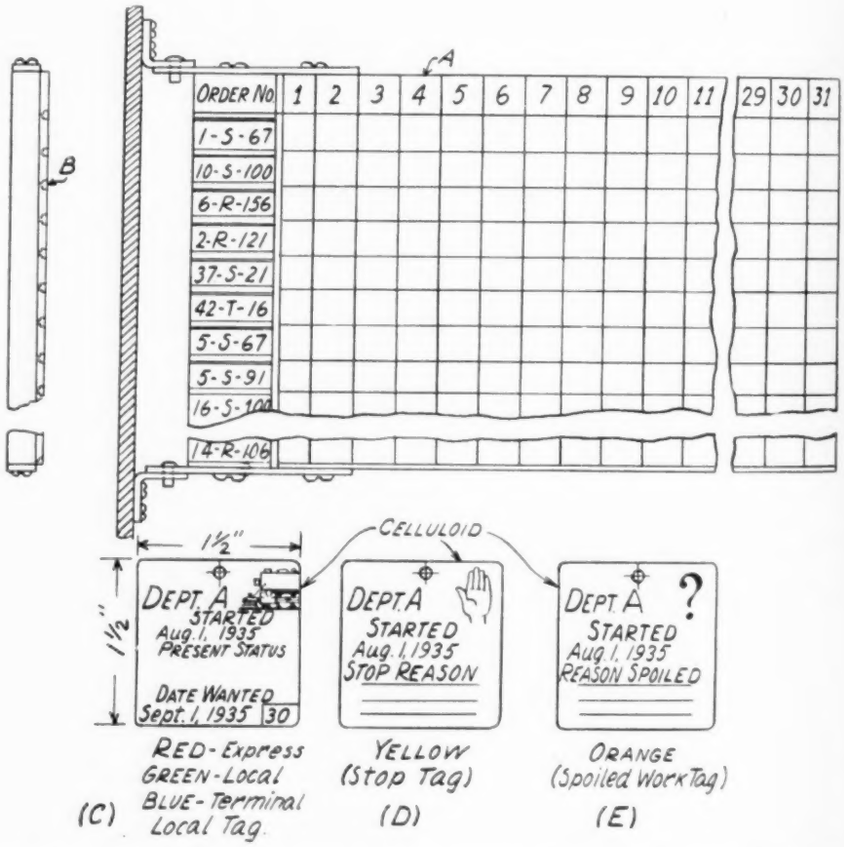
The second group, symbolized by the color green, were orders which once started in a department must be completed as soon as possible and transported to the next department immediately. In the next department these orders might be held up long enough to permit group one orders to be completed. These were known as "thrulocal" orders.

Group three orders, symbolized by the color blue, were known as "terminal local" orders, and consisted chiefly of "fill in" orders to keep the various departments busy on standard parts and other service parts during slack periods.

System Keys Into Dispatch Board

With this much of the system developed, a dispatch board similar to a train dispatch board ordinarily seen in any large railroad station was designed. It consisted of a hinged board, *A*, along one side of which renewable cards could be slid into the guides, *B*. These boards were made 3 feet high and 4 feet long. Along the top of the boards a row of numbers running from 1 to 31 were spaced. Vertical and horizontal lines were then drawn dividing the board into sections, about 1½ inches square.

The back of the board was likewise arranged, here numbers ranged from 32 to 62. Both sides of the board in a given line were employed for the same order number. Small



This dispatch board and several types of colored celluloid tags constituted the principal elements of a system devised by a manufacturing plant to facilitate the scheduling of jobs through the various departments

hooks were screwed into each section for holding the tags *C*, *D*, and *E*. These tags were of celluloid upon which were printed certain legends.

Tag *C* was made in three different colors; red, green and blue. The general data on all these tags were the same. First, the abbreviation, "Dept." was printed in the upper left-hand corner, with a space in which the department letter could be written in. In the upper right-hand corner the forepart of a locomotive speeding along symbolized the thought of continuous movement. Under the space provided for the department letter the word "Started" was printed, with a space left below for filling in the date on which the order was originally released for processing. Under this space came two words, "Present Status" with a space below it for a few terse words to be written in describing the present condition of the job.

As the job progressed through the shop, it might start out with a red tag, switch over to a green tag, and back to a red tag. Or it might start out with a green tag and switch over to a red tag, as conditions required. On the first trial, the date of completion of the job, represented by the words "Date Wanted," was not incorporated on the tags, but this was found to be essential information and was later incorporated as shown.

Keeping Track of Jobs

Each day a tag of the required color, filled in with the required directional data, was hung upon the board. The dispatch department was kept informed during the day of the status of each job and thus was able to keep a record of the department in which the work was stationed. The person in charge of the scheduling changed the colors from red to green to blue, or visa versa, according to the urgency of the jobs, or according to customers requests.

Each morning the foreman of the department would report to the scheduling department, where he would receive a list of the jobs for his department to work on that day. He was also given a list indicating where the job was the day before, and he was held responsible for seeing that the job was moved into his department from the preceding department. Upon the tag hung on the schedule board, his department letter was written in.

In the event that he could not carry the job through, or he could not get the order through from the preceding department, he was compelled to report to the scheduling or dispatch department, with the cause for delay. If the delay was the cause of the previous department, that department's letter was placed on the tag, and under the heading "Present Status" the cause for the delay. If, on the other hand, it was held up in the department to which it was charged, then that department's letter and the cause of the delay was filled in.

There were other reasons, however, why orders were held up, such as engineering changes, customers changes, and the like. Such stoppages in the schedule were denoted by the yellow tag, *D*, which was essentially the same as *C* excepting that it had in the upper right hand corner the conventional hand signal for stop, and below the words "Stop Reason." In this space was written the cause for stopping the job.

Efficiency of a department and of employes in a department usually can be judged by the time required to turn out a given job, and by the infrequency with which work is spoiled. The first factor is pretty well covered by the aforementioned tags; the latter factor is taken care of by the orange tag, *E*. This tag is similar to all the others, excepting that in the upper right-hand corner is a question mark, indicating, that time, material, and profits on this job have gone to waste for what purpose? Under the heading "Reason Spoiled" is placed the reason.

Advantages With This System

After a period of 30 days operation, another important addition was made to the red, green, and blue tags. In their lower right-hand corners, a small square was added, in which was written the number of days between the date of starting the job and the date of delivery. This permitted the scheduling department to estimate quickly the number of days left for delivery, which could be done easily by subtracting the number of days at the head of the particular column from the number of days specified on the tag.

The advantages gained by this method of scheduling were as follows:

1. The ease with which it was possible to accelerate or diminish the speed of orders at any point in the processing program.

2. The ease with which it was possible to spot instantly all orders requiring urgent attention, those requiring the second best urgent attention, and those which could be allowed to job along at the present rate.

3. The ease with which it was possible to obtain a complete historical record of the job from beginning to end; the frequency with which the rate of processing had been changed; the cause for such changes; the number of stoppages which had developed along the line of processing, and the reason for stoppages or delays together with the person or persons, or causes responsible for the delays of one kind or another.

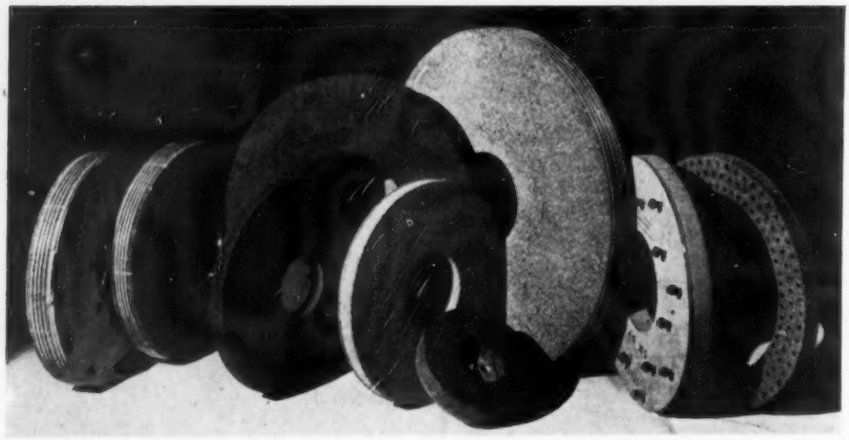
How Each Job's Status Is Shown

4. In conjunction with a simple calendar chart upon which there was indicated the estimated number of days each job was supposed to remain in the various departments, it was possible to determine the state of completion of each job, by noting from the calendar chart which additional departments the work must pass through and the number of days each of these departments were to consume on the job. These two factors multiplied together, and subtracted from the total number of allowable days, should at all times equal the difference between the number at the head of the particular column and the figure given in the lower right-hand corner of the job tag.

If the difference between the number at the head of the column and the number on the tag was more than the first difference, the job, if, an express order, was switched over to a through or terminal local order If, on the other hand, the first difference was more, and the order was a local order, it was immediately switched over to an express order.

Steel Reduces Hazards of Road

WHEN THIS NEW ALL-STEEL SCHOOL BUS BODY TURNED OVER COMPLETELY IN A DITCH, minor bruises constituted the extent of injuries to the 32 occupants. Developed and placed in production by the Blue Bird Body Co., in its new 750-foot assembly line at Fort Valley, Ga., the 13½-foot steel body weighs 1800 pounds and has full air flow lines



Abrasive disks are made in a variety of types, bonds and abrasives to meet all conditions

New Type Disks Speed Up, Improve Grinding Operations

BY R. G. VAN KEUREN
Norton Co.

DURING recent years, use of disk grinders has increased rapidly. In step with this trend, improved disks have been developed so that today many manufacturers are enjoying benefits of faster cutting action, longer life and ease of mounting, which are outstanding features of the newer types of disks.

Uses to which disks are put are many and varied; in fact, there seems to be practically no job in the rough and semi-precision surfacing line that cannot be successfully done on some type of disk. Notable among disk grinding jobs is squaring of the ends of coil springs, which particular application has gained in importance with adoption of the new types of front wheel suspensions on automobiles.

Coil springs, regardless of size or type, usually must be ground to insure proper length and to make certain that the spring ends are in the right relation to the spring axis. This is particularly true of the front wheel suspension type where considerable load and strain is imposed on the spring itself. Grinding of such springs usually consists of surfacing both ends—this operation being done on double-head disk grinders. Valve, clutch, drag link and many other of the smaller coil springs used in automotive construction are similarly ground, as are many sizes and types of coil springs used in railroad cars.

This end grinding operation is performed either wet or dry, depending upon the spring maker's equipment and experience. In general, smaller work is ground dry while heavier jobs requiring more stock removal appear to be better accomplished wet. Under both conditions vitrified, bakelite and silicate bonded disks are each producing very satisfactory results.

Applications Are Diversified

Piston ring manufacture involves many grinding operations, one of which — surfacing the sides — has proven to be an ideal disk job. Here again double head disk grinders are used extensively.

Leaf spring grinding, that is, squaring the ends of the eyes, formerly done on disk grinders mounting cylinder wheels in chucks, is now satisfactorily performed on the newer type of disks. For this job a coarse, fast cutting disk is usually required —a characteristic typical of bakelite and vitrified bonded disks.

Off-hand grinding of cast iron and steel is a common disk operation. Such work usually is ground on so-called single end, horizontal spindle,

THE accompanying article is prepared from a contribution appearing in the June issue of GRITS AND GRINDS *published by the Norton Co., Worcester, Mass. It deals particularly with present-day applications of disk grinding and new and improved types of grinding disks developed by that company. The author, R. G. Van Keuren, is affiliated with the company's sales engineering department*

DISK grinding easily and quickly provides an even, squared-up surface on die blocks

disk grinders. This is particularly true of the smaller classes of work. On such machines disks of the several types available are economically used. Larger, heavier work like gear and crankcase covers, manifolds, loom frames and other awkward castings are often ground on vertical spindle disk machines of the rubbing bed type. For the large vertical spindle units, segmental disks bakelite bonded are particularly satisfactory.

In tool manufacturing there are innumerable grinding operations which can be quickly and accurately done on disks. Among these are squaring of die ends—both hard and soft, beveling cutting tools of all types, sharpening all kinds of turning tools made of the many available steels and carbides, and surfacing of wrench heads.

Garden tool makers, especially those manufacturing hedge trimming shears, have found many useful disk applications.

One of the notable features of the new disks made by the Norton Co. is the mechanical means of fastening the disk to the machine through the use of inserts or lugs cast in the disk or by the secure attachment of the disk to a convenient metal mounting plate. Coincidental with the new means of mounting has come the building of disks in greater thicknesses, the advantage of which lies in the fact that disk changes are less frequent and smaller stocks need to be kept on hand. Of the three available types of mountings, the cemented style is rapidly giving way to the new mechanical types.

Disks Have Controlled Structure

Another distinctive feature of the disks is the fact that all, regardless of type, are made by the controlled structure method of manufacture which permits closer fitting of the grinding action to a given job and assures duplication of grinding performance from disk to disk.

The inserted-nut type or lug-mounted disks, as they are sometimes called, are increasing in popularity because the mounting means are so simple yet secure. Essentially, such disks are ordinary grinding wheels having inserts cast in one side for engaging bolts, thus effecting a secure mechanical mounting. Disks provided with this means of mounting can be had in any of four of the conventional grinding wheel bonds; namely, vitrified, bakelite, silicate and shellac. In vitrified and bakelite bonds they are made in two forms, solid and segmental. The segmental vitrified disks are designed for use on severe dry grinding jobs where the sharp, crisp cutting action of a vitrified abrasive is desirable, while the solid variety are intended for wet grinding or on very light dry operations. Vitrified disks, like vitrified grinding wheels, should not be used at speeds exceeding 6500 surface feet per minute. Silicate solid disks are subject to grinding wheel qualifications insofar as their field of application is concerned.

Bakelite solid disks are not so limited in their application since the strength characteristics of the bond itself permit them to be used on any disk job. Only in the large sizes (40 inches and over) are bakelite disks made segmental.

Shellac bonded disks, while not as common, are very desirable on some jobs. They may be used wet or dry.

Plate mounted disks are a still more recent development in the disk field and, like the inserted nut type, are rapidly making their way forward. As the name implies, plate mounted disks are abrasive wheels which are securely vulcanized to their metal driving plates. Since disks of this kind do not have inserts imbedded in them, they may be entirely consumed and because there is no wasted abrasive such disks are economical for many jobs. Since each disk comes equipped with its own metal plate, returning of plates for re-disking is not required. Such disks, however, should not be used without a heavy driving plate of the same diameter as the disk itself.

Types of Mountings

To facilitate mounting, disks of this type are built on plates of two different styles. The one more commonly used in the smaller disk sizes has a number of screw holes equally spaced about the center or pilot hole. The other style has one or more annular rows of screws which project from the face of the plate.

Plate mounted disks are made in all standard bonds but are built in the solid one-piece style only. Consequently they are somewhat restricted in their use, the field of application being generally the same as that previously mentioned for disks of the inserted nut type.

How to Avoid Trouble

Even though the newly developed disks are desirable on many jobs, it is wise to remember that a good many old type grinders were designed to mount disks not over ½-inch thick. As a consequence the use of disks 2 and 3 inches thick on such equipment is likely to invite trouble by overloading the spindle and bearings thus causing vibration and consequent inaccurate work, and perhaps introducing danger of breakage.

Closely related to the question of proper disk thickness is the matter of proper disk support; that is, the correct thickness of driving plate. No arbitrary standard can be set but the back plate must be rigid and heavy enough to withstand the maximum side pressure exerted against the disk without flexing. If the plate is too thin and there is a tendency toward flexing, disk breakage is likely.

While standard makes of disk grinders operate at speeds between 5500 and 7500 surface feet, there is a tendency for some users to attempt even higher speeds, the thought being that increased speed will result in increased economy. Experience has indicated that such is not the case and this practice should be discouraged. Usually when speed is raised any appreciable amount, the resulting grinding action appears harder, thus making it necessary to supply a softer grade of disk which in turn is weaker and consequently more susceptible to breakage.

Coil springs for automobile suspension are ground on a double-head disk grinder

METHODS AND MATERIALS

Quenching Trouble Cured By Straight Mineral Oil

An example of trouble encountered through an incorrect oil and corrected by proper selection is the case of a quenching oil used rather extensively in the plant of a twist drill manufacturer. For proper hardening, the red hot drills are quenched in oil for cooling to obtain the exact degree of hardness. The oil must be cooled by refrigeration and anything that interferes with the refrigeration interferes with the quenching operation.

Difficulty was experienced recently because the oil did not cool properly in the refrigerating unit. Investigation showed that the quenching oil then being used contained a high percentage of lard which separated out of the oil when it reached the cooling tank, solidified on the ammonia pipes and prevented them from absorbing the heat from the oil.

When a good grade of straight mineral oil was substituted, this trouble was not only eliminated but the oil could be cooled 20 degrees lower with less circulation.

S S S

Coca-Cola Is Produced and Shipped in Stainless Steel

Installation of stainless steel mixing tanks, sugar feeders and all product pipe lines in the New Orleans plant of the Coca-Cola Co., Atlanta, Ga., just has been completed, USS 18-8, manufactured by subsidiaries of the United States Steel Corp., being the material used. The tanks, illustrated herewith, have capacity of 5000 gallons each and were specially designed in co-operation with engineers of the Coca-Cola Co. so that the syrup will come in contact with nothing but stainless steel.

The company also has ordered its second thousand stainless steel barrels, also illustrated herewith, for the shipment of its syrup. This is a highly volatile product and is affected by contact with most metals and alloys. Adoption of stainless steel for such containers was the result of tests lasting over 18 months which showed that this material is adequate to this purpose.

The stainless steel drums have capacity of 55 gallons each and are made of No. 16 gage stainless steel sheets with dense cold-rolled finish, clean silvery white in appearance. Both body and head are of this material, the external chimes and rolling hoops being of cadmium plated plain carbon steel. About 70 pounds of stainless are consumed in the manufacture of each drum.

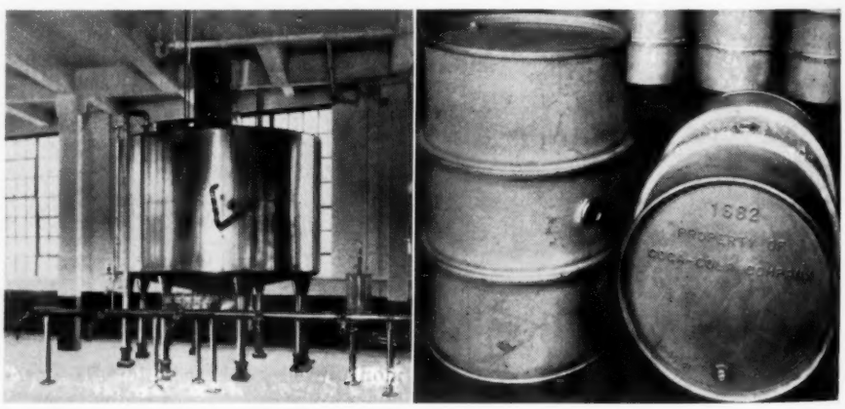
The design provides for a ¾-inch vent on the top to be opened when the syrup is being drained and a 2⅜-inch opening in the side through which the syrup passes in and out. The latter opening has a patented metal cap with a cork seal which is destroyed by opening and cannot be re-used, therefore preventing substitution. A special plug is inserted in empties for return to the plant.

S S S

Alloys Steel Castings Used In Boulder Dam Turbine

Castings of chromium-vanadium steel are to play an important part in the operation of the world's largest power turbine at Boulder dam. The 115,000-horsepower water turbine now being constructed by the Allis-Chalmers Mfg. Co., Milwaukee, has 120 turbine guide vanes weighing almost a ton apiece.

Sixty of these vanes were cast by the Milwaukee Steel Foundry Co., Milwaukee, and another 60 by the Falk Corp., of the same city. The rigid specifications established for the castings were met without difficulty by use of the chromium-vanadium steel. Some idea of the size of the turbine is gained from the size of the alloy steel levers which operate the relief valves. One casting weighing over 3½ tons, with sections varying from 2½ to 10 inches in thickness, and



Coca-Cola Co., Atlanta, Ga., has adopted a policy of 100 per cent stainless steel utilization in connection with the manufacture and shipment of its famous beverage syrup. To the left is shown a 5000-gallon mixing tank in the company's new New Orleans plant, and at the left 55-gallon drums, all made of 18-8 stainless steel furnished by subsidiaries of United States Steel Corp.

others only slightly smaller, were furnished by the Machined Steel Castings Co., Alliance, O., for this purpose.

Exceptionally favorable physical properties were obtained in these large castings by use of manganese-vanadium steel. After normalizing and tempering, the following physical properties were obtained: Yield point, 72,250 pounds per square inch; tensile strength, 104,000 pounds per square inch; elongation in 2 inches, 26.5 per cent; and reduction of area, 57.0 per cent.

S S S

Gravestones and Markers Now Made from Sheets

Goodheart Memorial Co., Belleville, Ill., has developed a complete line of headstones and grave markers made of porcelain enameled, 12-gage sheets furnished by the American Rolling Mill Co., Middletown, O.

Exteriors are given six coats of porcelain enamel and interiors two. The enamel is guaranteed not to peel, discolor, rust or tarnish. Finished to simulate marble or granite, these memorials are available in a range of designs. The rain cleans them. They come in several colors with markers to match. When permanently installed they are securely bolted to a stone base. Special porcelain enamel nameplates are attached to the sides of the markers and the tops of the headstones. Emblems also can be attached if desired. Because of their relatively light weight they may be transported and handled easily and the price is much lower than that of the conventional memorial.

S S S

Develops New Porcelain Enamel for Cast Iron

A new series of lead-free porcelain enamels for cast iron claimed to afford a perfect match in whiteness with sheet iron and steel enamels, is announced by the Porcelain Enamel & Mfg. Co., Baltimore, Md. These new enamels, it is said, are easily workable and require no special treatment. The frit has been developed from a series of leadless enamels produced by this company for the last eight years.

The manufacturer believes the new enamel will prove advantageous in eliminating the difficulties often encountered where finished cast iron and sheet iron or steel pieces do not match in color.

S S S

Greases for Bearings

Choice of the proper type of grease for lubricating antffriction bearings depends upon the conditions of the installation. The lime base greases are fundamentally water resistant but are liable to separation at high temperatures and under the churning accompanying high bearing speeds; they are therefore recommended only under certain wet conditions. Soda base greases, while more soluble in water, are far better able to withstand prolonged agitation and high temperatures, and are superior for this use.

Only the highest quality greases, and those free of fillers, such as graphite, pumice, free lime or talc, are suitable. They should be neutral lubricants which will not separate or channel in service.

Free-Machining, Selenium-Containing Alloy Steels Covered by Patents

PATENTS covering free machining alloy steels containing selenium were granted on July 30 to Frank R. Palmer and assigned to the Carpenter Steel Co., Reading, Pa., of which Mr. Palmer is assistant to president.

"The utility of selenium as a free machining element," states the company's announcement, "has been established during the past few years through its extensive use in 18-8 chromium nickel stainless steel. It is revealed now that this same selenium gives promise of successful use in practically all other types of iron and steel products.

"Sulphur has been extensively used in low carbon non-alloy steels for many years and is quite familiar to the trade under the general name of 'screw stock.' It is well known that sulphur combines with certain metals in the steel, usually manganese, to form non-metallic sulphides which occur in the form of slag-like stringers in rolled or drawn bars. In high sulphur steel the extent of this non-metallic matter is sufficient to discourage its use in high grade alloy steels which must be heat treated and are later subjected to severe service.

"It is claimed that selenium is superior to sulphur as a free machining element in two important particulars. First of all, a given percentage of selenium does not produce nearly as much slag-like material as an equal percentage of sulphur so that the cleanness and uniformity of the products are greatly increased. Secondly, selenium is more potent in its free machining effects than sulphur so that a smaller percentage of selenium is required in order to produce the same free machining effect. These two advantages combine to produce a steel which is very much cleaner and more uniform than would be a higher sulphur steel having the same machining properties.

Practically All Steels Studied

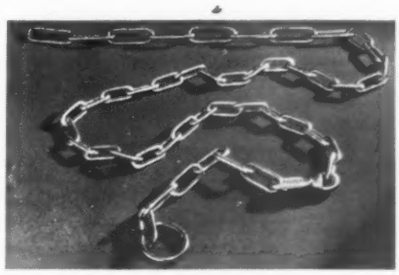
"It is further claimed that the presence of selenium does not interfere with the response of the material to heat treatment and it is anticipated that many applications will be found where free machining S.A.E. alloy steels can be satisfactorily applied.

"The experimental work described in these patents is extremely comprehensive covering practically all S.A.E. types of analyses, both in the low carbon carburizing grades and in the higher carbon tempering grades. It is further extended to cover many different types of alloy and plain carbon tool steels.

"Offsetting the natural advantages

Rats Can't Eat Steel

Thousands of tons of steel wire are consumed annually in manufacturing trace chains. They are extensively used all over the country and particularly in the South for harnessing mules to wagons, carts, plows and other farming aids. Steel traces are cheaper than leather and rats cannot eat them. Alloy steels now are being used increasingly in making trace chains. That shown in the illustration is produced by Chain Products Co., Cleveland, from molybdenum alloy steel wire ¼, 9/32 or 5/16-inch in diameter. It is of the straight link type, formed in automatic chain machines, with links closed by automatic resistance welding. At one end is a steel ring or hook. To keep chain self-straightening it is provided with a malleable iron swivel. These chains weigh 8 to 10 pounds per pair.



that selenium has over sulphur as a free machining agent, there appear to be two disadvantages. In the first place, selenium is more expensive than sulphur so that its use will doubtless be reflected in the higher price of the product. In the second place, all of the work done thus far has been on electric furnace melted steel which is rather conducive to higher quality than lower costs. It therefore seems likely that the applications of these new free machining alloy steels will be somewhat selective and at least temporarily may be limited to the manufacture of parts in which the machining costs are relatively high compared to the weight of steel involved."

Refrigerator Manufacturer Makes Spot Welds with Seam Welding Machines

MAKING spot welds with seam welding machines is somewhat out of the ordinary, but this is the practice being followed by the General Electric Co., Schenectady, N. Y., in the manufacture of evaporators for electric refrigerators. This company performs this work on a battery of 16 seam welders, each capable of making 300 spots per minute; when all 16 are in operation, welds are made at the rate of 4800 per minute.

Evaporators are made up of two matched sheets of 18-8 stainless steel with corrugations or flutes pressed into the surface of one sheet to form evaporating chambers. The two sheets are joined, as shown in the accompanying illustration, by running a pressure-tight seam weld around the outer edges and by closely spaced spot welds between the corrugations. Originally, the spot welds were made by spot welders at the rate of 150 per minute, but experience proved that these welds could be produced better and more rapidly by intermittent seam welding using essentially the same type of machine which makes the pressure tight seam weld.

Therefore, the 16 type 1000 series seam welders, manufactured by the Thomson-Gibb Electric Welding Co., Lynn, Mass., were installed to make both types of welds. Several of these machines are shown in the illustration. Intermittent seam welds are made by applying the current in short cycles in relation to the speed of the welding rolls. By this new practice, the spot welds are produced at double former speed.

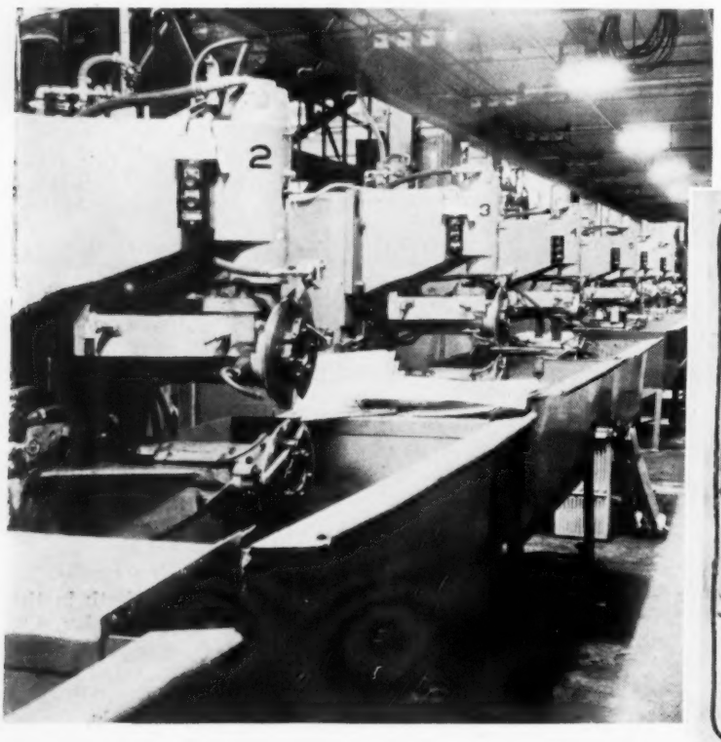
An interesting feature of these seam welders is the design of the welding roll. The welds must start close against an obstruction on either end of the evaporator shell. By cutting out a small segment of both the upper and lower rolls, a way was provided to fit the parts between the rolls and to start the weld flush against the obstruction.

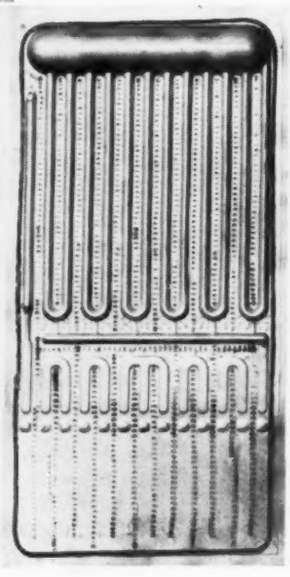
Because the design of the evaporator calls for seams of varying length it is not possible to make these welds in one continuous operation. It requires only a little longer, however, for the operator to start the weld at one end, run it half way down the piece and then turn the work end for end and start another weld which meets the first in the center. To make this operation as efficient as possible, the welding rolls are fitted with an arrangement of counter-weights which bring the segments back into starting position as soon as the foot valve operating the machine is released.

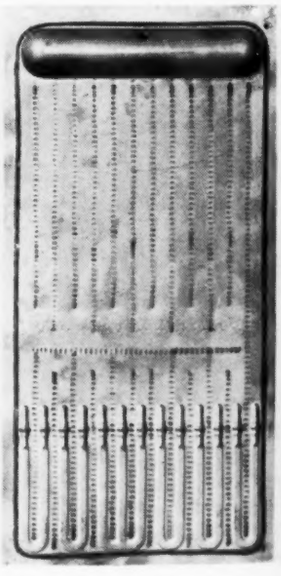
Reduced Efficiency in Hot Weather May Be Prevented

Different seasons of the year influence the fatigue or productivity of plant operators in different ways, according to Dean F. W. Shumard of the National School of Time Study, Norwalk, Conn.

During the month of August each year there is a period when the humidity and temperature are so high as to prevent usual output. Unless plant departments are protected by modern air conditioning, the capacity of nearly all operators is reduced even though they expend more than their customary effort. This situation is sometimes met by introduc-







AT THE left are shown several of the 16 electric seam welders used in fabricating stainless steel refrigerator evaporators. Below are shown the two sides of an evaporator. The pressure-tight seam welds and the intermittent seam welds can be seen clearly

PUBLIC ENEMIES

. . . in the SHEET METAL WORLD

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ing relaxation periods twice daily at which time all machinery is stopped, or other operators inducted to carry on while the regular ones are regaining energy.

However, this practice is looked upon with disfavor by many manufacturers because of the contention that many workers will violate relaxation periods and thus cause further enervation, instead of restored energy available for performance following the daily recesses.

Under average weather conditions the performance of each worker can be accurately measured. The product of his skill, and many other items converted to effective effort, results in definite output from which costs are projected.

During "dog days" the usual normal costs are erratic because the customary effort expended has resulted in less than normal output. This anomaly can be met by establishing production data for each man based on past performance during favorable weather conditions and using this data as an index. Thus, under average conditions, an operator will produce his usual output per day, but during adverse weather conditions, that same amount of production would require more hours per day. The difference between these latter required hours and the normal hours per day is an excess cost which can be charged to suitable accounts and thereby protect the operators who work harder and produce less during bad weather periods.

The ideal working temperatures for average indoor operations should be from 65 to 70 degrees Fahr. to fall within a proper rest factor range. The atmosphere should be reasonably free from injurious ingredients. If the air breathed by operators is too hot, dry, cold, humid, dusty, full of gas, oil, grease or acid fumes or other unpleasant smells, then heavier rest factors must be granted. The time study engineer should promptly make recommendations covering exhaust fans or ventilating means of overcoming these vitality-reducing dangers and point out to shop safety committees the economy of suitable protection against them.

Seeks Manufacturer of Stainless Spring Steel

A reader of STEEL writes that he is interested in obtaining a source of supply for stainless spring steel for use in the manufacture of lubricators. The requirements are widths from ¾ to 1¼ inches and thickness ranging from 0.006 to 0.010-inch.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Penalties Are Dangerous

THE young, vigorous and profitable welding industry shows striking examples of the three levels of business enterprise: The prosperous one-man business; the one-man business emerging into the intermediate or institutional stage; the big business with all its strength and weakness. Nature, relentless in her evolutionary processes, permits some to survive in all levels, eliminates others.

Condensed to the case of an individual, the drama of survival in business is as thrilling as any other human conflict. An able and enterprising man finds a product or service people want and will buy. He founds a small business and supplies the need. His costs are low and he earns profits; people give him the breaks because he is the under dog.

Contracts Caesar's Trouble

He soon gets a little surplus of capital. Ambition seizes him; he wants to broaden his field of service, to organize his business to survive his own disability or death. He expands and buys new equipment. His costs rise and he is no longer the under dog. He invites the discipline of big business and at the same time resents its necessity. The job becomes increasingly difficult, yet to turn back is unthinkable.

Having left the psychological security of a one-man business, he must learn to work in harmony with other men's minds. He must deal effectively with development and invention. From the czar of a little business he tends to develop into the leader of a delicately adjusted industrial organization.

If he emerges successfully into the third level of big business, it is because he has developed consistently in mental stature and in the capacity to adjust himself socially and psychologically to his new station in the business world.

The fact that these three levels of business do exist seems to indicate that they exist by necessity. Attempts to penalize, by taxation, one level to the benefit of the other two are dangerous.

Welding Costs

Fillet welds are used in welded steel machinery parts probably ten times as much as butt or lap welds. On ⅝-inch plate, the arc welding operator can use 5/16-inch diameter welding rod and 300 amperes if the job is positioned so that he can make the fillet weld in the downward position. On the other hand, if the job is not positioned, he can only use 5/32-inch diameter welding rod and 150 amperes. It costs about five times as much to make fillet welds when they are not positioned as when they are positioned properly.

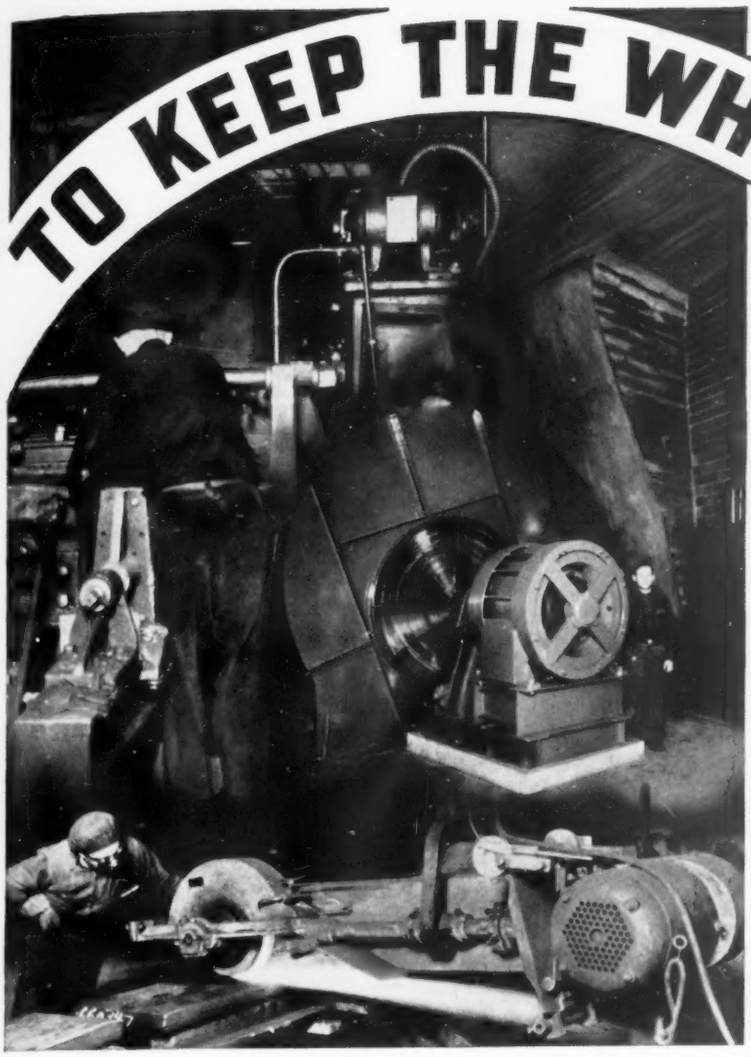
Sparks and Flashes

The common saying that ownership of a patent is merely a license to be sued has lost a good deal of its point in view of the practice of many large corporations. If a corporation owns a patent, has plenty of money in the bank, has a smart patent lawyer, you will do a lot better by just recognizing their patent rights. Conversely, you will find that they will be inclined to deal reasonably with anyone who owns a patent they want.

* * *

A well-known monorail for overhead material handling has the lower flange of the I-beam made of high-carbon steel welded to the web. An extremely clever sequence of welding beads effectively heat treats the high-carbon steel adjacent to the weld. Proper sequence of welding and annealing beads may permit excellent welds in alloys which are often considered unweldable.

TO KEEP THE WHEELS TURNING



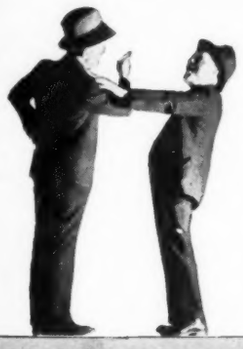
TO KEEP the wheels turning requires the best of qualities in both men and motors. We, at Lincoln, accept it as our responsibility to see to it that "Linc-Weld" motors have more than the required horsepower to keep your wheels turning. This extra horsepower, available in every "Linc-Weld" motor, assures you of extra protection against failure.

And the "Linc-Weld" motor is also amply protected against the attacks of dust, dirt and acid fumes. Its waterproof insulation is permanently pliable—will never dry out or crack.

The "Linc-Weld" frame is built of skyscraper construction—rolled steel for greatest strength and rigidity with least bulk. Thus it contains more iron and more copper to give "Linc-Weld" the extra horsepower without sacrifice of power factor or efficiency.

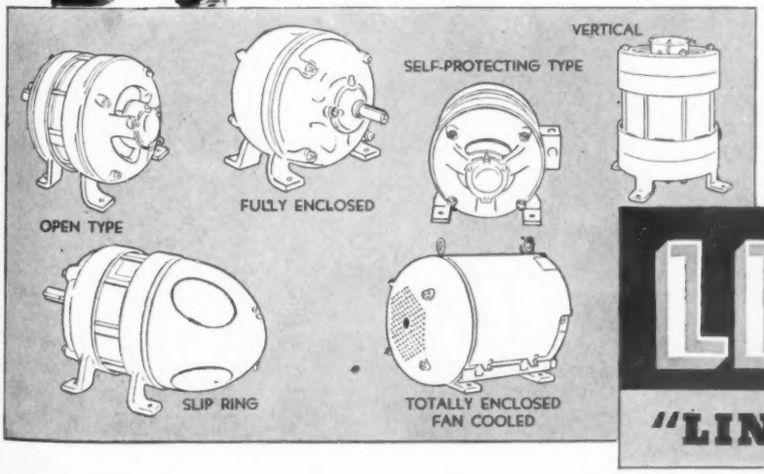
We suggest that if it is responsibility to keep the wheels turning you investigate all the advantages "Linc-Weld" motors can offer you. Write THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO.

M-17



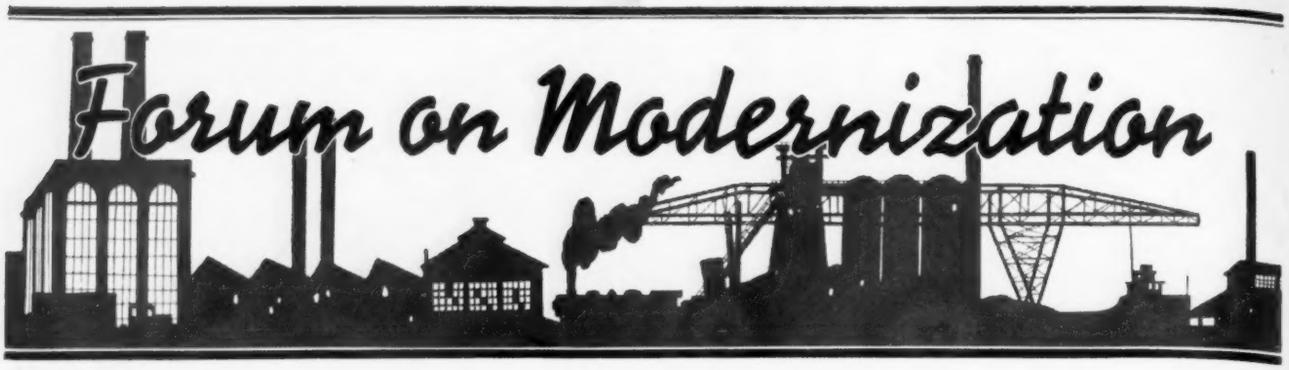
POP "You know, Lad, you never get anything for nothing. Now who pays for the extra overload capacity of the 'Linc-Weld' motors?"

LAD "That is one of the profits of progress, Pop. The 'Linc-Weld' user profits by Lincoln's progress in motor design. As long as you buy old style motors you pay for the losses of lethargy."



LINCOLN

"LINC-WELD" MOTORS



Combustion, Heat Treating Equipment Aims at Higher Quality, Lower Cost

BY FRANK H. ADAMS
General Manager, Surface Combustion Corp., Toledo, O.

OUT of the fog of economic theories which have swept through the industrial world in the past few years at least one fundamental persists—that real progress requires better products at lower costs. While the difficulties and confusion of these years have delayed much equipment replacement in industry, the major equipment manufacturers have intensified their efforts to advance the contribution their equipment can make to this goal and to supply the inevitable need of such equipment.

In every field of industry are new methods and equipment which are opening new opportunities to aggressive manufacturers and are rapidly setting new competitive standards. The question of buying is not one of "whether to buy or not to buy" but how long such buying can be deferred without serious loss of business and opportunities.

Reduce Unit Costs in Heat Treating

In the field of combustion and heat teratment, improvements and refinements have been made which have opened entirely new opportunities for better products at lower cost.

The questions of first cost and fuel efficiency are not primarily factors in the question of furnace selection. The real factors to be considered are operating costs, plus fixed charges, distributed over the products—the total cost to produce a unit of heat treated material. This total cost must take into consideration all the factors represented by the investment, the quality of the product and the performance of the furnace as one unit in the complete process.

For example, the development of positive control of furnace atmosphere has made former heat treating standards absolute in many processes. It is true that temperature distribution, rate of heat input, methods of handling materials mechanically, methods to insure duplication of operating conditions independent of the skill of the furnace operator, freedom from maintenance trouble, type of fuel and fuel costs are still items of great importance affecting a decision on this class of equipment. The controlled atmosphere furnace necessitates investigation in the manufacturer's departments that were, in the past, considered separate and distinct from the heat treating department in order to determine the saving possible in these other departments due to the employment of atmosphere furnaces.

Advantages of Controlled Atmosphere

In the automotive and allied industries, investigations are being made into the value of controlled atmosphere process heat treating machines to determine the values of controlled atmosphere units due to:

1. Continuous and batch methods of carburizing;
2. The partial or total elimination of pickling or sand blasting;
3. Elimination of decarburizing material;
4. Lower inventory in respect to material in process;
5. The ability to machine to closer limits;
6. The ability to machine and grind to final size, eliminating the final machining operation after heat treatment;
7. Decreased inspection costs; and
8. Cleanliness, better working conditions and saving in floor space resulting from partial or total elimination of items mentioned above.

The gas carburizing process is not new. For a number of years steels have been carburized successfully by being placed within an externally heated muffle, fed with a hydrocarbon atmosphere, the depth of case depending upon the time held at temperatures, the type of gas and type of steel employed. Recent developments, however, have made it possible to use a continuous furnace for this purpose, making gas carburizing applicable to mass production such as is required in the modern plants handling heavy quantities of steel daily. One of the main advantages is that this continuous gas carburizing process has reduced operating costs and brought about other desired features, such as accurate control of case depth,

Treated Surfaces Free of Scale

Other developments now make it possible also to clean harden and clean anneal steel in continuous automatic furnaces of the conveyor type, producing a surface which is practically free from scale and decarburization. Such a process again requires special atmosphere to preserve the original surface of the metal as charged into the furnace for treatment.

A similar method is employed for bright annealing certain nonferrous metals and alloys, such as copper, brass, nickel-silver and silver. A special gas generator is employed to produce an atmosphere for these operations at low cost.

Another example of the use of controlled atmospheres, made possible by the development of firing system in radiant tubes, is the radiant tube sheet annealing bell-type furnace. While saving in operating costs will pay for these furnaces in from one to two years, a far more important factor is the uniformity of anneal which is not possible with the old type box annealing.

In addition to that class of equipment which has been so improved as to make existing equipment obsolete, on account of its inability to produce a

FOR the past ten weeks STEEL has published articles by leading figures in the machine tool industry, talking straight from the shoulder on the problem of rehabilitation in terms of the profits to be made from investments in new tools. Machine tools have been featured in this series because of the great interest in the coming Machine Tool Exposition to be held in Cleveland in September, and also because if the gates are open for new machine tools they are opened automatically for other capital goods. The series is expanded herewith to embrace all classes of equipment of interest to the steel producing and metalworking industries. Billions of dollars' pent-up demand for capital goods exists. Here is an exchange-place for information and ideas which will help to unlock this log-jam of business. Contributions to the "Forum" are welcomed.

satisfactory product, there is a class of furnace equipment, such for example, as soaking pits, where new equipment is desirable from the standpoint of lower costs and improved quality but where existing types of furnaces will still heat materials in passable fashion. In this case the temptation is to say quickly, "Get along with present equipment for the time being." At the same time a careful study will frequently show these advantages and increased earnings may be had with little in the way of added investment.

We face a condition today where, in many instances, equipment of this kind has been run almost to destruction. Increasing production of steel is demanding this heating capacity in good working order. The present outlook calls for a major repair or rebuild and not merely a job of patching with its abnormally high operating cost and frequent delays in production.

In most cases the cost of a major rebuild cannot be justified by comparison with the cost of a modern pit with its much greater ingot capacity. Two pits, of the one way type, of 10-ingot capacity per hole will more than replace three reversing pits of 6-ingot capacity in the same space now occupied by the reversing pits. The cost may not be appreciably more and all the advantages of the most modern operation is gained. Where this condition exists there can be little question as to the desirability of buying new equipment now.

Profit Making Possibilities of Modern Tools Demand Check by Managements

BY W. D. CREIDER
General Manager, Oilgear Co., Milwaukee

YOUR request for opinions regarding the advisability of replacing obsolete equipment with up-to-date equipment comes at a time when the shortening of the work week and gradual increase in all costs, together with the shortage everywhere of skilled labor, combine to make this a paramount question with the metalworking industry. Certainly the forces which combine at the present time to increase the unit cost of production must be combated in an intelligent manner if the metalworking industry is to survive and prosper.

There have been such a large number of improvements made in metalworking machinery in the past several years, that it behooves management to keep informed as to the profit-making possibilities of new and replacement equipment. A close check of present unit cost against the possible cost through purchase of new and up-to-date machine tools is not only desirable but extremely necessary.

Overall Advantages of New Tools

A great deal of thought has been given in the past decade to development of machine tools which embody features for reducing dependence upon the human element for accuracy, finish and production, as well as the reduction of fatigue of the operator. These improvements make less serious the shortage of skilled labor, reduce possibilities of accidents to the operator, insure volume production, accuracy, finish, and reduce inspection and assembly costs. This latter is an important item which is often overlooked, but which may constitute an excessive burden because it may easily become habitual to such an extent that assembly departments come to accept poor machine work as a matter of course.

It is a well known fact that a machine tool need not be obsolete, merely because it is 10 or 20 years old. There are many instances, however, where the supervisory force must exercise a great deal of resourcefulness in order to keep an old machine in the catagory of assets.

Adapting Old Tools to New Standards

Being manufacturers of rotary and linear variable-speed hydraulic transmissions, we have been called upon many times to transform an old machine which could not maintain its pace into a machine which could hold its own with more up-to-date tools. On one special job where the user could not afford to spend $12,000 for a special machine, an old lathe bed with a cone head and $1200 worth of hydraulic equipment was all that was necessary to supply a perfectly acceptable machine which has since taken care of all the user's demands.

In another instance a large double-end lathe used for facing two sides of a large casting was a man killer, in that the feed was accomplished by hand. At a nominal cost, hydraulic feed was installed and the job done as well as any new tool could do it, with no effort whatever on the part of the operator.

With regard to new machine tools, we have brought out a vertical, automatic, multiple broaching machine. This machine is designed to use one, two, or three broaches; it can be used as entirely automatic, semiautomatic, or be manually operated, as desired. The operator does not handle the broaching tools after the job is once set up. This machine is built in several sizes and has a production capacity in excess of any single horizontal machine of the

(Please turn to Page 62)

VISION —— *"There's Gold*

Prospectors of Old found Gold in "Them Thar Hills".

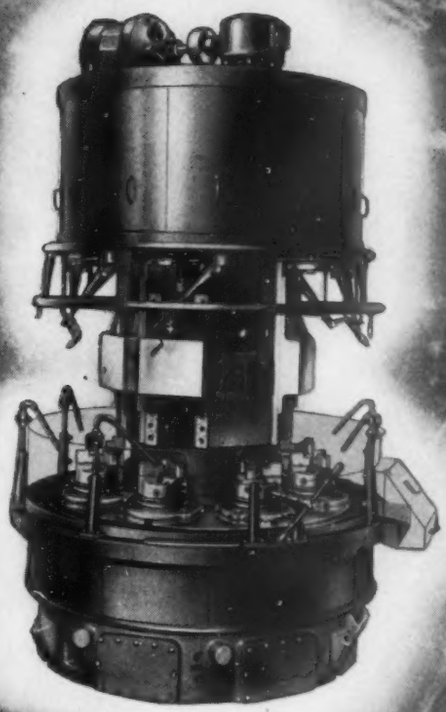
Today, Industrial Prospectors are also looking for Gold. The Vision of the Modern Prospectors, aided by the Vision of Engineering, makes it possible for Industry to obtain Gold through manufacturing Efficiency, Savings and Productability of machine equipment.

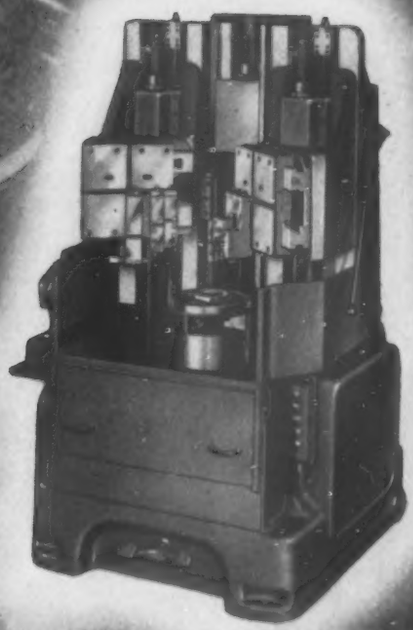
Bullard offers Small Type "J" Mult-Au-Matic for those small high-speed jobs and the large Type "D" Mult-Au-Matic for those heavier, fast jobs.

Bullard Single Spindle Vertical Automatic Lathe, characterized by Flex-Au-Mobility, provides a means of manufacturing economy in Single Unit or Battery installations on

THE BULLARD COMPANY

in Them Thar Hills"





those jobs of lower production volume and frequent or occasional "change-over".

Every Job has within it that Gold known as "Better Profits". The wise Prospector selects the Best Method for getting his share.

Let Bullard Grub-Stake you to surveys of your requirements, and then supply your Method for getting that Gold — Your Better share of available Profits.

The machines illustrated here will be in operation for your approval at the National Machine Tool Builders' Show — Cleveland Auditorium — September 10 to 21 — Bullard Booth 205.

BRIDGEPORT, CONNECTICUT

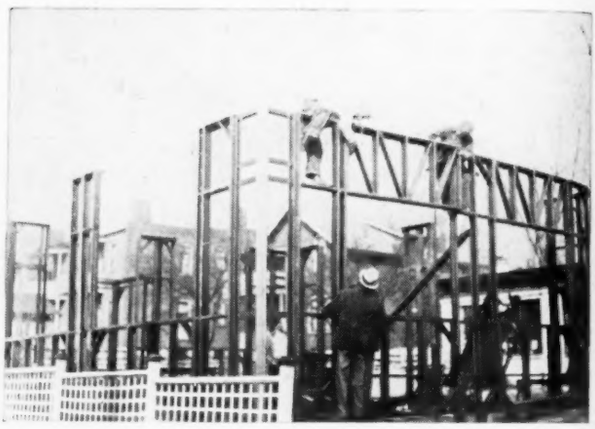
Steel Framework for Gasoline Station Erected in 6 Hours

Work of Assembling Prefabricated Structure Starts at 8 A.M.—Is Completed at 2 P.M.

8 A.M.

9 A.M.

10 A.M.



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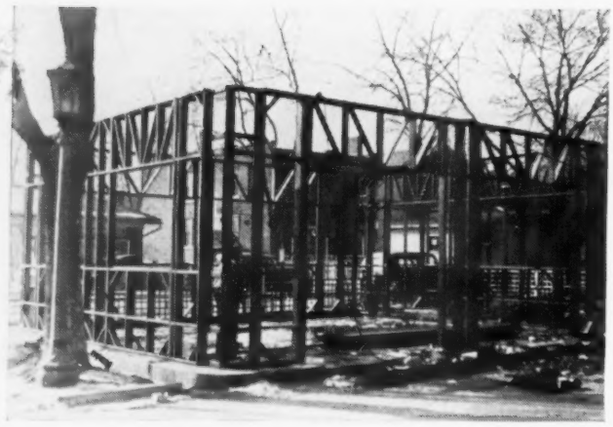
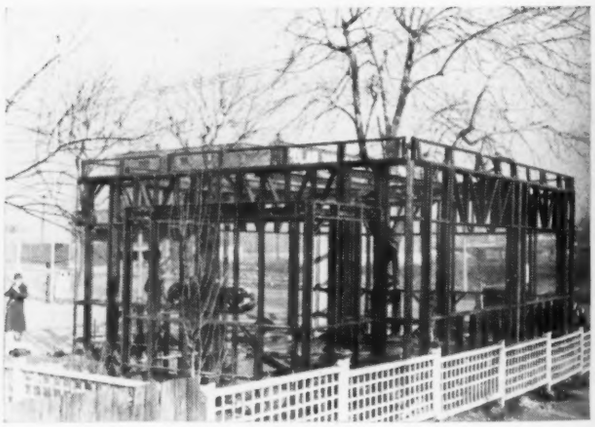


12 Noon



2 P.M.

Built by the Dresser Engineering Co., Tulsa, Okla., and erected in St. Louis for the Shell Petroleum Corp., this modern filling station comprises a two-car lubritorium and an office

—Courtesy National Petroleum News

Stainless Steel Strip Used For Furnace Conveyor Belts

ONE of the promising uses for stainless steel strip is that of conveyor belts for continuous, conveyor-type heat treating furnaces. Because of the heat-resisting qualities which this material affords, manufacturers of stainless strip are receiving many inquiries for wide widths and long lengths to be made into endless belts for furnaces, particularly annealing furnaces.

Among plants which have been using stainless conveyor belts with notable success is the Allied Products Corp., Detroit, a well-known manufacturer of high-quality bolts and cap screws. All of this company's continuous, conveyor-type hardening and drawing furnaces are equipped with this type of belt, as shown in the accompanying illustrations.

Bolts are made in a wide variety of sizes and shapes from S.A.E. 1035 steel. Victor Peninsular 30-37 steel, S.A.E. 3135 steel, and Victor Peninsular 14-20 steel. Total hearth length in each furnace is 15 feet. Of the two hardening furnaces, one is fired with city gas, the other with fuel oil; the drawing furnaces are fired with city gas.

Furnaces Held at 1600 Degrees Fahr.

Equipped with eight burners each, the hardening furnaces are maintained at a temperature of 1600 degrees Fahr. by means of automatic control. Burners at the charge and discharge ends are under separate control. Speed of the conveyor belts is variable to adjust for the sizes of bolts and types of steel to bring the material just above critical temperature and to hold it long enough to allow for complete solution of the carbon. Each hardening furnace has capacity for 1000 pounds per hour.

The drawing furnaces are operated at temperatures ranging between 600 and 1400 degrees Fahr., depending upon what physical properties are required in the finished product. As in the case of the hardening furnaces, the speed of the conveyor belts can be varied to suit the requirements.

The conveyor belts are made from 18-gage Armco 17 chrome stainless steel strip rolled by the American Rolling Mill Co., Middletown, O. This steel has the following approximate composition: Carbon, 0.12 per cent maximum; chromium, 16.00-18.00 per cent; silicon, 0.50 per cent maximum; and copper, 0.50 per cent minimum.

How Belts Are Fabricated

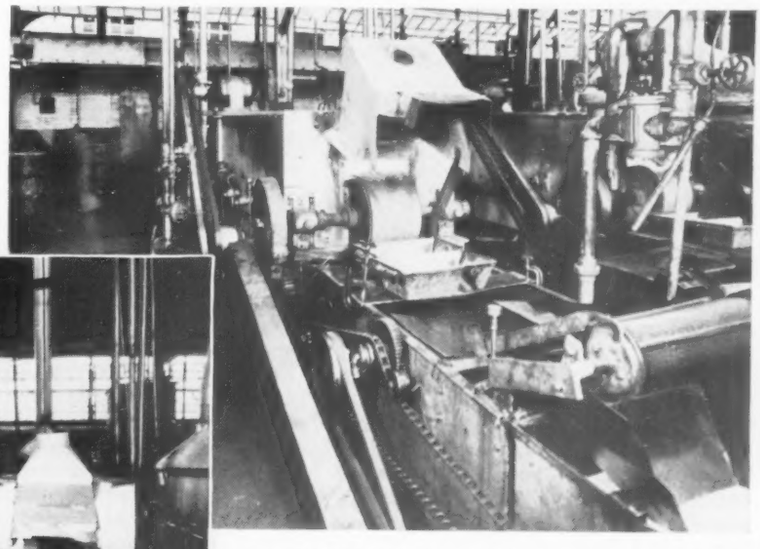
The belts are fabricated by punching out the edges with 11/16 x 13/64-inch holes spaced 17/32-inch apart. These slotted edges are then bent to 90 degrees to form the sides of the belts; the bend being made 9/16-inch in from the edge of the strip. This slotting allows the belt to pass over the 18-inch drive pulley at the discharge end of each furnace. In the case of the hardening furnaces, the pulleys at the charge end are 30 inches in diameter; the pulleys on the draw furnaces are the same at both ends, namely, 18 inches diameter.

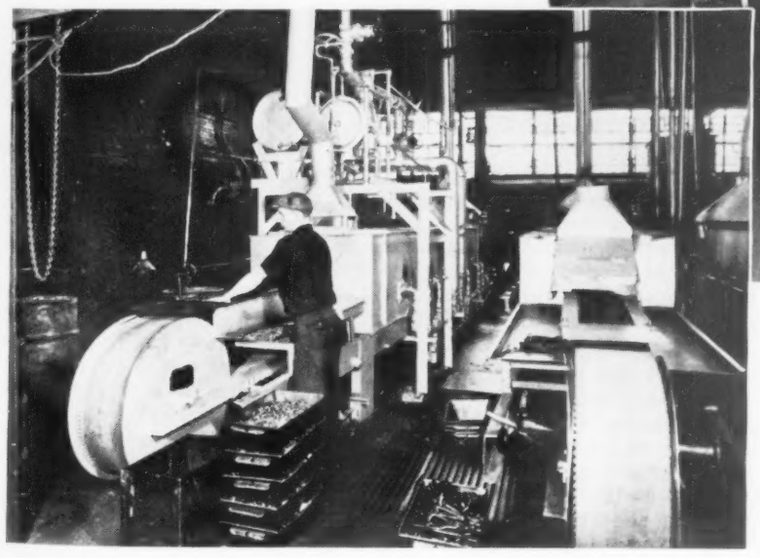
Nothing except stainless steel has been utilized for the conveyor belts for these furnaces. However, it was the practice formerly to fabricate the belts from several short length of strip; now each belt is made from a single strip, with only one joint in the 53-foot length. It is obvious, therefore, that straightness is a very important requisite in the purchased strip. Worn out belts are sold as alloy scrap.

Revives Publication on Vanadium Alloy Steels

After a lapse of about 18 years, the Vanadium Corp of America, 120 Broadway, New York, has revived its monthly publication *Vanadium Facts*, devoted to applications and accomplishments of modern alloy steels, irons, and other metals, and of the alloys by which their properties are established. The new edition, starting with July, is an attractive 8-page publication edited in easy reading style and well illustrated.

Originally introduced in March, 1911, as *American Vanadium Facts*, the publication was isued for more than six years until war time problems intervened.





STAINLESS steel strip is used for the conveyor belts in these continuous furnaces for heat treating bolts and cap screws. The belts are 53 feet long and are made from single strips of 18-gage 16-18 per cent chrome steel. The illustration at the left shows the charge end of the two hardening furnaces with the belts passing over the 30-inch diameter pulleys. The pulleys at the discharge end of all furnaces are 18 inches diameter as shown in the illustration above

Small Acid Open-Hearth Furnace Has One-Half Ton Capacity

BY J. TRANTIN JR.

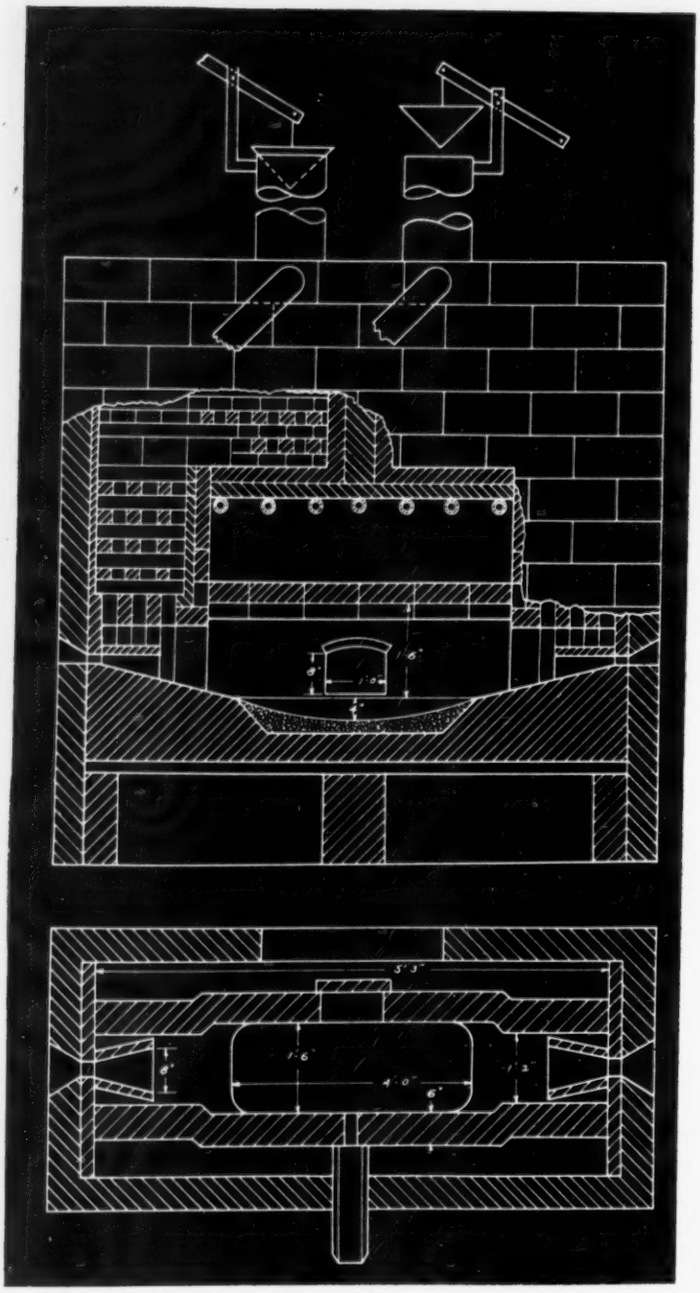


Fig. 1 (above)—Cutaway view of the furnace showing construction of checkers; (below) top view showing size of bath

AS THE outgrowth of a succession of attempts to provide a melting unit for making small heats to further research on alloy steels and irons, a small acid open-hearth installation recently has been developed. From a crude makeshift apparatus, to which a number of progressive improvements have been applied, a furnace of commercial proportions has resulted.

Original Design Modified

The original design utilized one center-fired flame; coal gas being ignited and conveyed through a curved chamber which entered the furnace at the center of the roof. Dispersion and distribution of the flame was controlled by adjusting ports at the ends. This installation was exceedingly satisfactory for iron, but did not produce a high temperature sufficiently uniform to melt steel, due to the lack of proper flame control. After exhaustive experimentation and application of numerous ramifications of designs within the realm of possibility, the arrangement shown in Figs. 1 and 2 finally was adopted.

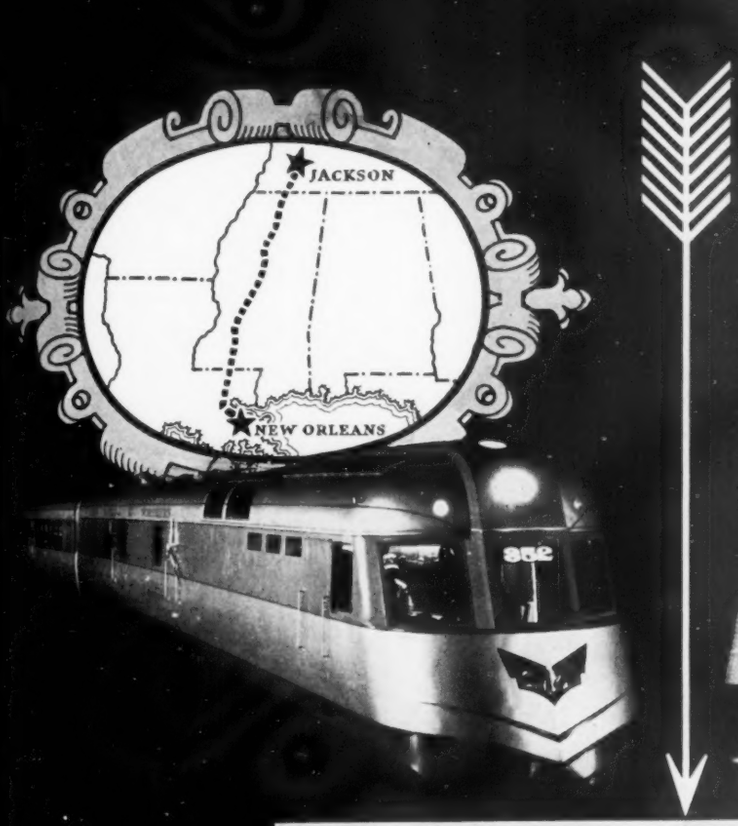
It will be noted that the construction of this open-hearth furnace is somewhat of a departure from that of the standard open-hearth installations of larger capacities. The greatest difference in design is in the arrangement of the checker work, both as to the position or location of the checkers, and the direction of flow of exhaust gases. It is believed that this method of checker construction brings the point of maximum superheating closer to the ports and by shortening the distance of travel of the gases from the furnace to the checkers the heat losses due to conduction are reduced to a minimum. After leaving the end ports, the products of combustion filter through the sides and top into the first row of checkers and after several directional reverses are exhausted through the furnace stack.

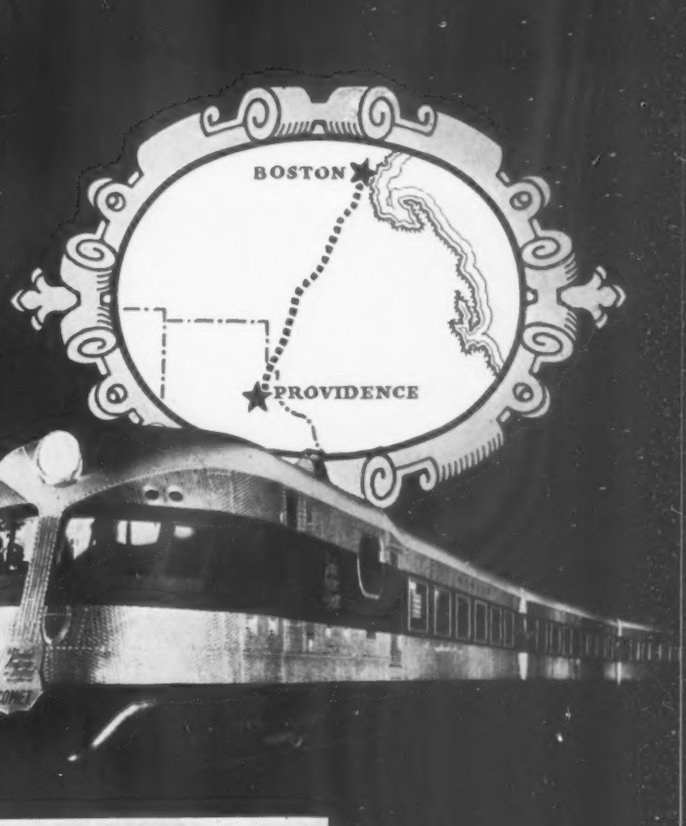
The first two rows of checkers consist of 3 x 6 x 9-inch fire brick arranged so as to allow openings measuring 3 x 3 inches. The succeeding rows are constructed of 3 x 3 x 6-inch bricks and also are provided with the same size openings.

Pressures Are Under Control

A positive pressure blower supplies air to the checkers at 12 ounce pressure. The air enters at the top of the checkers through pipes with constricted openings. A damper is provided in each of the blast pipes and likewise each stack is fitted with a damper at the top. The dampers in the blast pipes are operated individually so as to permit flexibility and control of the flame entering the furnace. Through the regulation of these dampers it is possible to operate the furnace under pressure, at atmospheric pressure or under a partial vacuum to suit the conditions necessary for the type of material to be melted.

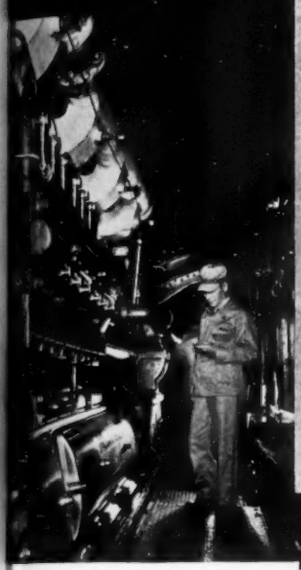
The burners consist of pipes and fittings having a 3/32-inch orifice with an equal sized air opening.





Gulf LUBRICATES MODERN STREAMLINE TRAINS

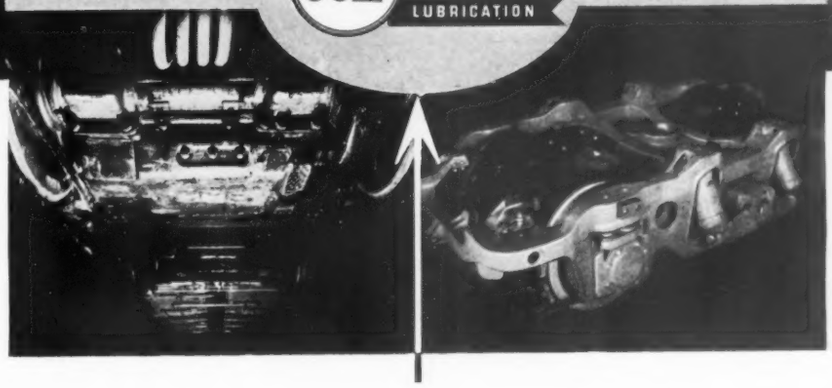
GULF INDUSTRIAL LUBRICATION

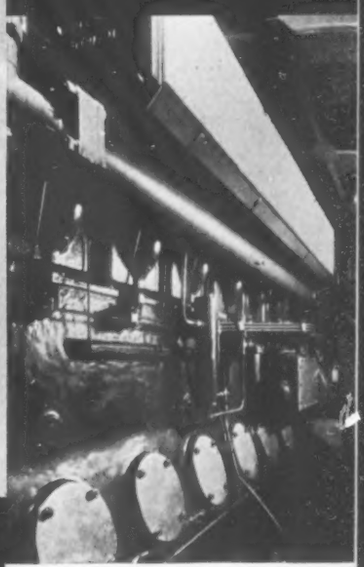


Top—One of the two new streamline trains, known as the "Rebel," which the Gulf, Mobile & Northern Railroad will operate between Jackson, Tennessee and New Orleans, will be 100% Gulf lubricated.

Above—Gulfcrown Oil and other Gulf lubricants have been selected for this 660 H.P. Diesel engine which powers the "Rebel."

Right—Underneath view of electric motors and other driving mechanism of power car of "Rebel."





Top—The "Comet"—new high speed streamline train of New York, New Haven & Hartford Railroad, now 100% Gulf lubricated.

Above—Gulfcrown Oil and other Gulf lubricants protect the two 450 H. P. Diesel engines which power the "Comet."

Left—One of the trucks of the "Comet" showing motor driven axles; also a center plate hung on parallelogram device supported by four oil-filled shock absorbers.

GULF *Railway Lubricants selected for the* "COMET" *and the* "REBEL"

GULF is proud of the part Gulf quality lubricants are playing in the railroad Renaissance in America.

Protection for the great Diesel engines, which drive the powerful dynamos supplying power for the electric motors of these sparkling new trains, is essential to their reliable and continuous operation.

America's Diesel engine builders, more than 50 strong, have officially approved Gulf Diesel lubricating oils for the lubrication of their engines. Gulf engineers have cooperated with builders of these new streamline trains and builders of Diesel engines in the selection and application of Gulf quality lubricants to provide best possible protection for important equipment.

From Gulf's complete line of more than 400 industrial and railroad lubricants, the oils and greases best suited to the requirements of your particular equipment can be scientifically selected. Call a Gulf lubrication engineer to assist you in getting the most for your lubrication dollar.

GULF REFINING COMPANY
PITTSBURGH, PA.

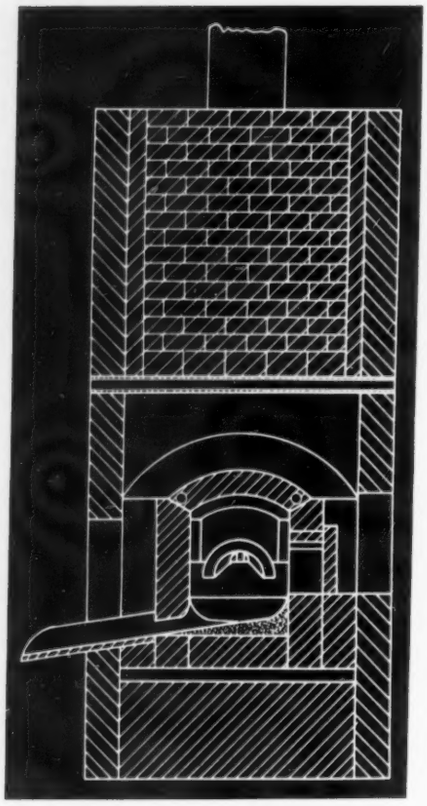


Fig. 2—Construction shown by transverse section through the center

Needle valves for the oil and air are provided but the oil is permitted an unrestricted flow while the air volume is controlled. Atomizing air is maintained at 45 pounds pressure by a regulating valve and the oil is supplied at 25 pounds pressure.

Crankcase drainings from automobiles constitute a satisfactory and economical source of fuel. However, the use of that material necessitates treatment with a light oil to permit extraction of inert particles and subsequent blending with tar to increase the heating value.

Owing to the presence of inert and undissolved greases, it is necessary to subject that material to a treatment with a light oil or heat and subsequent filtering or straining. Further blending with tar is necessary to increase the heating value.

For steel practice, a fuel ranging from 25 to 30 degrees Baume works satisfactorily. For cast irons, a lighter fuel may be used if desired. The operating pressures previously given are for a 30 degree oil. Under these conditions the oil consumption is approximately 10 gallons per hour.

The maximum capacity of this open-hearth furnace installation is about 1000 pounds of steel while heats of 100 pounds capacity may be made with success. Cast iron heats as small as 50 pounds may be melted with comparative ease. A 300-pound heat of steel requires from 1½ to 3 hours from charge to tap, depending upon the specifications, and a similar sized heat of cast iron may be tapped in 45 minutes or less. The time required for heating the checkers preparatory to melting, starting from a cold furnace, is approximately three hours.

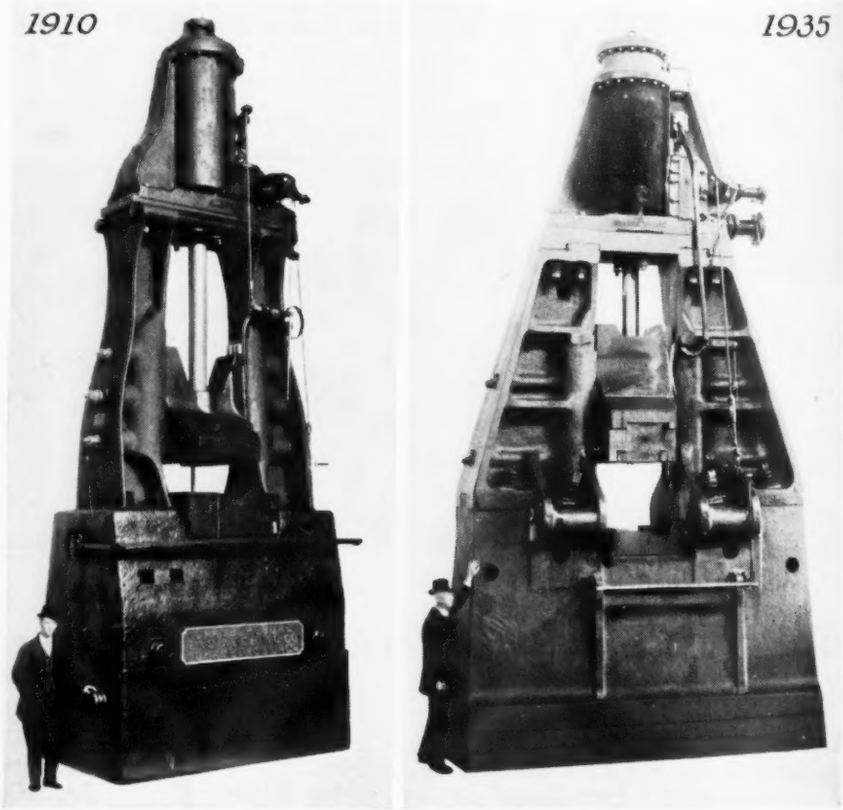
Manipulation of heats is accomplished the same as in larger units. The bottom may be either rammed or burned in. This type of furnace provides a number of distinct advantages, such as close control of analyses; ease of operation; flexibility; rapidity of melting and above all economy of operation. Practically any type of alloy steel may be manufactured with attendant economies. The unit is suited to the manufacturing of alloy irons, since it may be used in conjunction with a cupola for duplexing or it may be used to melt from the cold state and for superheating. Alloying is accomplished readily since the heat may be held until diffusion is complete and due to the fact that the atmosphere may be controlled readily. Oxidizable elements may be introduced with minimum losses. The power cost of the installation is exceedingly low since both the blower and compressor are driven by a 6-cylinder gasoline engine which utilizes natural gas as a fuel. The fuel cost is from 6 to 7 cents per hour.

25 Years of Progress in Drop Hammers

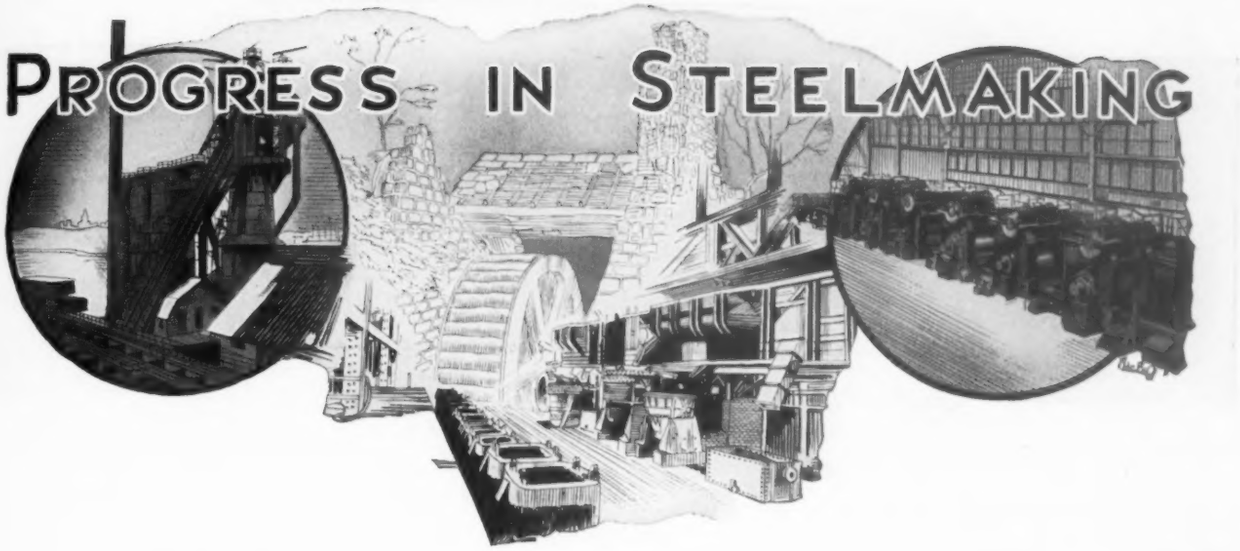
WITH the introduction of the new model "E" steam drop hammer by the Chambersburg Engineering Co., Chambersburg, Pa., and the recent completion of four 12,000-pound hammers of this model, reference to the company's photographic files has disclosed a steam drop hammer of similar proportions of 25 years ago. Both hammers shown in the accompanying illustration are of 12,000 pounds capacity, but the similarity ends there.

The present day hammer is just as much more efficient in performance over its ancestor of 1910 as it is more pleasing in its lines. This is a typical example of the new functional design in machinery that has been accepted by the public under the generic term of "streamlining." Obviously, these more pleasing lines result from allowing the efficient distribution of mass to determine the form of the machine.

Interesting also is the fact that the man standing beside the hammers is the same person—a veteran Chambersburg employe.



The 1935 steam drop hammer is as much more efficient in performance, compared with the hammer of 25 years ago, as it is more pleasing in appearance. Both units are of 12,000 pounds capacity



Increases Life of Linings

Application of a plastic cement for lining basic ladles for electric furnace steel has resulted in increasing the life of the lining from three to five times compared to average practice, as well as in the elimination of nonmetallic impurities as shown by a lower percentage of rejections. Some electric furnace operators are obtaining a maximum lining life of 25 heats compared with three to five under former practice. The plastic is a dry mix which incorporates the necessary bond. It is brought to a definite consistency by the addition of water and is rammed behind a form against the shell of the ladle. After all moisture is eliminated by slow drying the lining is heated to a dull red and is then ready for service. Some steelmakers advocate the application of about 1 inch of insulation next to the shell of the ladle to prevent the radiation of heat.

• • •

Prevents Rapid Unwinding

Applying an automatic brake to a newly marketed reel prevents wire from unwinding too rapidly. When the stock is pulled forward the roller raises, releasing the brake so that wire can be drawn without any resistance from the reel. As soon as sufficient stock has been unwound the spring pulls on the roller and throws in the brake. The unit is designed for coils weighing up to 100 pounds.

• • •

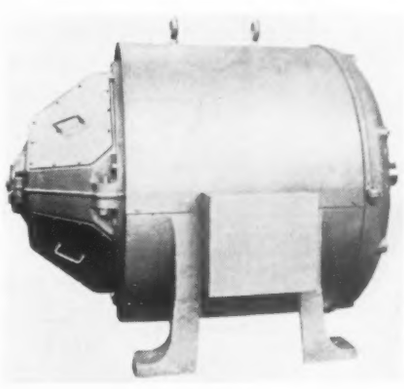
Tests Favor Iron Pyrites

Experiments involving over 50,000 tons of bessemer screw steel (from 0.100 to 0.180 per cent sulphur) recently were completed at a plant in the Pittsburgh district to determine a suitable means of making sulphur addition to this grade of steel. Comparison by billet chipping the steel to which iron pyrites was added in the converter and flowers of sulphur in the ladle disclosed that rejections and tons per man day both were normal with flowers of sulphur addition to the ladle whereas iron pyrites converter addition showed a 3½ per cent decrease in rejections and 1½ per cent increase in tons chipping production per man day. In other words, the iron pyrites practice affords a saving of 3½ per cent in the yield and faster chipping. Check chemical analyses on the billets indicated a pronounced uniformity of sulphur content throughout the blow and ingots.

• • •

Completes Large Motor

ARC-WELDED CONSTRUCTION WAS EMPLOYED in building the world's largest direct-current fully-enclosed fan-cooled motor shown in the accompaning illustration. The motor is 7½ feet long and weighs 14,000 pounds; it is rated at 125 horsepower at 300 revolutions per minute and is to be used for operating a pickling machine. The frame is made of 2-inch rolled steel, cut and formed into two semicircular sections, with holes punched for channels. The latter made of ¼-inch steel plate, then are welded to the frame all the way around, making them air tight. The air inside the motor circulates through these channels and an outer fan blows cooling air over the external surface. The motor was built by the Reliance Electric & Engineering Co., Cleveland, with shielded arc welding equipment supplied by the Lincoln Electric Co., Cleveland



Insulation Lowers Losses

Radiation losses through the shell of steelworks ladles, can be lowered materially by the use of insulation. A thinner lining also can be installed increasing the capacity of the ladle. The insulation in cement form is applied with a trowel to the interior of the shell to a thickness ranging from 1 to 1½ inches. No decrease in the service as a result of the thinner lining is apparent according to the observation of a steelworks executive.

• • •

Measures Zinc Coating

Specific thicknesses of zinc coatings on steel can be measured by chemical means by a newly introduced apparatus which makes use of the dropping method. A standard corrosive solution is permitted to fall on the coated work at the rate of 100 drops a minute. The thickness of the coating is determined by the length of time required for the zinc to be penetrated by the solution. Once the apparatus is regulated for 100 drops a minute, no further adjustment is required.

IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter IV — Part III

Typical Regenerator Chambers

UNIT thermal effects as found in the three types of wall construction are presented in Table CXV, and show clearly the thermal advantages of the insulated design. While the mean temperature value of 1500 degrees Fahr. as used is entirely correct, it should be noted particularly that the temperature effects in the upper portions of the wall actually may be similar to the temperature effects as developed for the roofs, Table CXII.

The graphic method by which the mean temperature of the hotter wall surface was developed is shown in Fig. 138 and is presumed to be representative of any or all types of fuel.

The air and gas regenerators of furnaces J, P, D and H have common center walls, all regenerator chambers of the balance of the furnaces having entirely separate chambers. The common center wall has advantages both in first and operating costs, but prevents the introduction of charging floor columns between the air and gas chambers. If the arrangement may be used convenient it is generally possible to increase regenerator width.

The author prefers this type of construction, using a 2-foot 9-inch center wall with preheated gas practice and a 2-foot 3-inch center wall where other types of fuel are used.

The thickness of the regenerator center wall as found in the typical furnaces are: J, 3 feet 4½ inches; P and D, 2 feet 3 inches; and H, 2 feet 7½ inches.

Separate Walls Recommended

In order to assure the absence of leakage between gas and air-filled chambers, the center wall should be constructed as two separate and distinct nonbonded walls. If the center wall is laid as a bonded unit, an expansion crack, if developed, is likely to extend from chamber to chamber and allow cross leakage, whereas an expansion crack in one side of the double wall seldom will register with a crack in the adjacent wall.

The construction cost of a 2-foot 9-inch center wall is $4.62 a square foot and there is in effect no heat flow through the wall.

As previously mentioned regenerator chambers 30 feet long will be shown in the improved 150-ton furnace. If the height of the regenerator walls is assumed 21½ feet, and the inner width of the gas and air chamber as 10 and 16 feet respectively, the wall area for a furnace may be found as 6344 square feet of radiating surface in the four chamber arrangement and 3764 square feet for the double chamber arrangement which in addition will have, 1290 square feet of center walls.

From the foregoing and the data of Tables CXIV and CXV the ultimate economics of regenerators based on a ten year life are calculated and presented in Table CXVI.

This again accentuates the economic value of the insulated over the uninsulated wall, definitely proves the material lower cost of operation of the double regenerator chamber over the individual arrangement and in particular demonstrates that the type B arrangement of 13½ inches fire brick with insulation is a superior economic design when compared to the type C wall which

Table CXV

Unit Thermal Effects in Selected Regenerator Walls[1]

Construction	Thermal resistance R*	Interface temp. t_2, deg. Fahr.	Cooler surface temp. t_a,† deg. Fahr.	Emission B.t.u./ft.²/hr. W
	a	b	c	d
13½-in. fire brick, 9-in. common brick	3.3	.....	250	376
13½-in. fire brick, 4½-in. class B ins.‡	7.45	1205	181	173
18-in. fire brick, 4½-in. class B ins.‡	8.0	1137	176	161

[1] Mean temperature, hotter surface, t_1, assumed as 1500 degrees Fahr.
*From Figs. 10 and 12.
†Solved by Figs. 19 and 20.
‡¼-inch steel plate outer covering.

Table CXVI

Life Economies of Regenerator Chamber Walls
(10 Year Life)

Wall type	Outer Walls: Area, sq. ft.	Outer Walls: First cost	Outer Walls: Radiation cost	Center Walls: Area, sq. ft.	Center Walls: First cost	Center Walls: Radiation cost	Total cost
	a	b	c	d	e	f	g
Four Separate Chambers							
A	6344	$18,715	$53,650	.....	.....	.....	$72,365
B	6344	19,603	24,700	.....	.....	.....	44,303
C	6344	23,600	22,980	.....	.....	.....	46,580
Two Double Chambers							
A	3764	11,104	31,850	1290	$5960	None	$48,914
B	3764	11,631	14,660	1290	5960	None	32,251
C	3764	14,002	13,640	1290	5960	None	33,602

has 4½ inches more refractory than the type B.

This calculation includes the walls at the front and back of the regenerator chambers as being of the same construction as the side walls. Examination of these components, Figs. 134 to 137, will indicate this to be incorrect in detail. However, no particular purpose would be served by modifying the figures to the slight differences that would result were the several constructions individually solved and it is believed the figures presented are representative of average conditions.

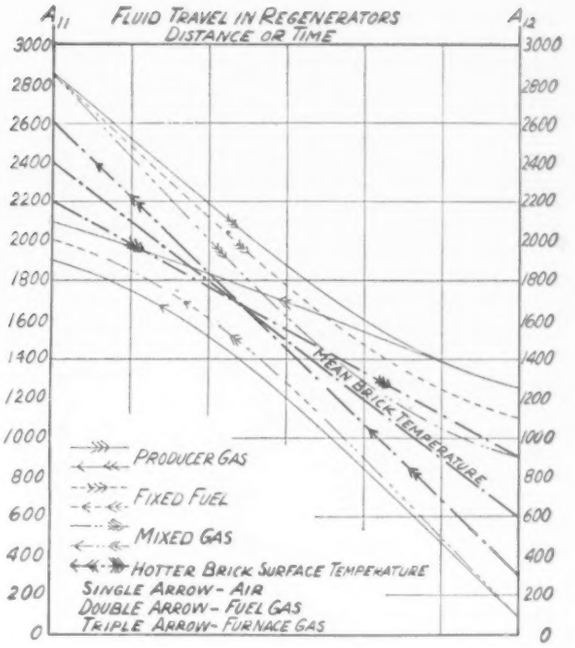


Fig. 138—Typical temperature conditions in open-hearth furnace regenerators

Choice of Materials Varies

REGENERATOR BOTTOMS: There appear to be many diversified opinions as to how or of what materials the bottoms of regenerator chambers should be constructed. Among the arrangements of bottom refractories the maximum thickness of bottom is found as 10 inches of common brick on a 10-inch hollow foundation, furnace A, N and O, while the minimum thickness, furnace G, is 2½ inches best brick on 2½ inches of class E insulation. The bottom first cited will protect amply the concrete foundation and that last mentioned likely will afford insufficient protection.

The regenerator bottom refractory is laid on the concrete pad which usually is poured on a cinder or similar fill. The concrete, the fill and the subground are all good insulators, and heat received by the foundation only can be dissipated by radiation beyond the edges of the concrete pad unless the subground is wet or otherwise cooled. In any event, it is probable that the concrete pad will reach to considerable and destructive temperature under long continued heating as in open-hearth operation, unless the upper surface of the concrete is ventilated by some method. The disintegration of the concrete pad would under some conditions necessitate an expensive rebuilding.

The use of the construction commonly called a "hollow foundation" assures the maintenance of the concrete pad in its proper condition and reduces the refractory requirements of the bottom proper.

Channels Extend Through Masonry

A typical hollow foundation is shown in Fig. 139. It consists of four courses of common brick laid flat with appropriate channels about 4½ inches wide by 5 inches high extending through the masonry in both directions. The term "common brick" is used to designate any cheap brick such as ordinary building brick, third-quality fire, ladle brick, etc. The cost of the 10-inch hollow foundation may be found from Table X to be about $1.18 per square foot, and when necessary to develop thermal data with common brick included, the thermal resistence is taken as the same as that for fire brick. It is obvious that the dimension or particular arrangements are of no particular importance and any of several designs will accomplish the desired results.

Hollow foundations, 8 inches thick, are found in furnaces I and B; 9½ inches thick, furnace L; 10 inches thick, furnace A, N and O; and, 13 inches thick, furnace D. A similar arrangement should be used under the slag pockets and is convenient under the flues.

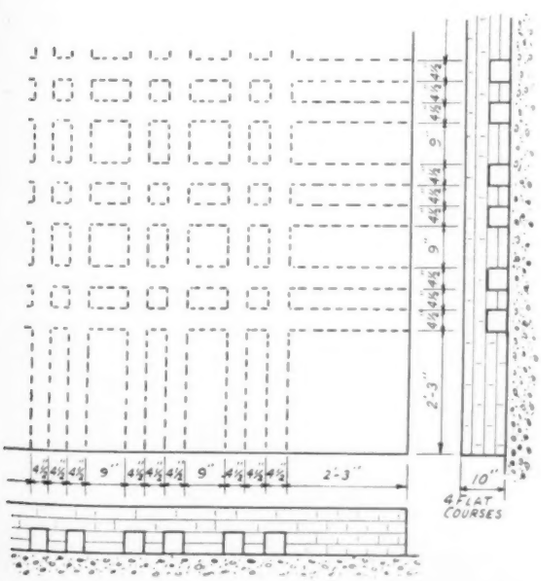


Fig. 139—Typical development of hollow foundation

Temperatures Are Nominal

The fluid temperatures affecting the bottom refractories are nominal. The maximum are to be found in the gas regenerators of producer gas fired furnaces in which they may reach 1500 or 1600 degrees Fahr. for short periods towards the end of a reversal cycle. Other than in the practice just mentioned the fluid temperatures may be expected to be less than 1400 degrees Fahr. Under these conditions if the regenerator bottom placed atop the hollow foundation consists of 5 inches of class E insulation and one 4½-inch course of second-grade fire brick, the radiation loss will be inconsiderable, and the concrete of the foundation well protected. This is the approved design. The square foot cost of 5-inch thick class E insulation is 80 cents and of 4½-inch thick best brick paving 63 cents a square foot.

THE RIDER SYSTEMS: The rider system, consisting of walls and tile, or walls, arches and tile, form the ducts at the bottom of the regenerator chambers through which the

cooled and effluent furnace gases pass to the flue system, and which receive the air or fuel gas to be preheated by passage through the checkers. The rider system supports the checkers and exerts considerable effect on the distribution of the gaseous fluids during their passage through the checkers.

Many Units Are Involved

Commonly, and as found in the typical regenerators excepting those of furnaces P and M, the rider walls consist of several units extending longitudinally of the regenerator chambers. These walls are spaced rather closely in one principal design and further apart in a second principal design.

In the first design as found in the chambers of furnaces A, N, O, D and F, the rider walls are carried to an appropriate height and spanned at right angles with the rider tile. The maximum spacing of the walls will depend upon the strength that may be developed in the tile. In the foregoing typical furnaces, the maximum spacing of the rider wall is found as A, 25⅞ inches; N and O, 29¼ inches; D, 34 inches, and F, 32¾ inches. The thickness of the rider walls is 6¾ inches for the first three and 9 inches for the last two.

In the second design, the rider walls are spanned with arches usually 4½ to 9 inches wide and 9 inches deep, which are leveled to form the surface upon which the rider title are laid to span the arches at right angles but parallel to the rider walls. Obviously, the arches will be spaced appropriately to the title to be employed.

The maximum spacing of the rider walls in the typical regenerators employing the second design are as follows: E, 2 feet, 7⅜ inches; L, 2 feet, 9 inches; G, 3 feet, 3 inches; B, 3 feet, 6 inches; J, 3 feet, 9 inches, and I and H, 4 feet, 1½ inches. The thickness of the rider walls, regenerator E, is 6¾ inches; L, 13½ inches; and, all others 9 inches.

If the rider system can be developed to produce the required areas for the storage of flue dust and the free flow of the gases and this may often be accomplished, the first design is the simpler and cheaper.

The rider tile should contain cross openings as in furnaces I, L and H in order to equalize fluid pressure and thus aid distribution. It is difficult to understand why this simple aid to better distribution usually is omitted.

The rider walls of the chambers of furnaces P and M consist of a series of semicircular arches extending across rather than lengthwise of the chambers. It is not believed this design is as convenient or as strong as the other designs described.

The rider tile are generally 3, 4 or 4½ inches thick, 12 to 15 inches wide and of appropriate length to span the openings developed between the rider walls or arches. The tile are spaced at such centers that the checkerwork may be developed to the desired openings. The entire rider system should be of best fire brick.

From the foregoing economic data developed for the roofs and walls and by an appropriate calculation to cover bottom construction and emission it is possible to develop the overall economics on a number of types of regenerator construction.

Table CXVII

Life Economies of Selected Regenerator Chamber Construction

(10 Year Life)

Component	——Uninsulated Costs—— First a	Radiation b	Total c	——Insulated Costs—— First d	Radiation e	Total f
15-in. roofs, Table CXIII	$4,420	$45,450	$49,870	$5,108	$20,980	$26,088
Type A walls, Table CXVI	18,715	53,650	72,365	.....	.....	.....
Type B walls, Table CXVI	.....	.....	.....	11,631	14,660	26,291
Center walls, Table CXVI	.....	.....	.....	5,960	.....	5,960
Bottoms, Hollow fdns. (10-in.)	2,667	.....	2,667	2,492	.....	2,492
Class E, ins. (5-in.)	.....	.....	.....	1,248	.....	1,248
Best brick (4½-in.)	983	7,898	8,881	983	3,405	4,388
Total costs	$26,785	$106,998	$133,783	$27,422	$39,045	$66,467

Data Are Tabulated

The data has been assembled for two arrangements and is presented in Table CXVII. In both cases the inner width of the gas chamber is taken as 10 feet, the air chamber 16 feet, and the inner length of all chambers 30 feet. One arrangement is uninsulated, the other completely insulated; 15-inch roofs are included in both cases. The uninsulated arrangement consists of four separate chambers, the insulated arrangement of two double chambers. Both designs have 10-inch hollow foundations calculated to total 2260 square feet for the uninsulated and 2112 square feet for the insulated design.

The best brick paving is taken as 1560 square feet for either arrangement, and the insulated design is assumed a like area of class E insulation. A calculation has been made for the radiation loss through each bottom which is taken as 225 B.t.u per square foot per hour in the uninsulated and 97 B.t.u. through the insulated bottom. These values are arbitrary at one-half the values found as were the cooler surfaces of the hollow foundations subject to the ordinary effects of natural convection.

The rider systems are not included in the costs as they would be essentially similar for either type and accordingly their inclusion would cause no modification of the figures.

Table CXVII indicates once again that the refractory costs are essentially similar for any design, bad or good, but that over normal life periods the better design pays substantial dividends.

Savings Are Afforded

If the ten year figures presented are reduced to an annual basis it will be found that the savings from the use of the insulated, center wall design is some $6700 over the uninsulated, four chamber type, and if this figure is multiplied by the ten to 14 furnaces of the usual plant, and bearing in mind the figures apply to a secondary item of the open-hearth system, the value of correct fundamental design is again proved.

The figures develop the savings accruing from the reduction of heat losses only. Actually, the savings in radiation will react in a more efficient checker operation and likely will cause an overall betterment in fuel practice of much greater money value than that shown.

(To be continued)

Correction

In the third paragraph on page 47 of the July 22 issue the radiation value should have been 578 B.t.u. instead of 5578 B.t.u.

Sound Nonferrous Castings

Slow melting is detrimental in obtaining sound nonferrous castings, and it usually indicates a reducing atmosphere due to lack of oxygen for proper combustion, according to one authority. With sand castings, that condition is indicated by numerous pinholes scattered throughout the metal. Rapid chilling obscures the appearance of the holes.

NEW EQUIPMENT

Horizontal Honing and Lapping Machine—

Hutto Engineering Co. Inc., 515 Lycaste avenue, Detroit, recently brought out a multiple-speed horizontal honing and lapping machine. Designated model MH-1800-H, shown below, the unit has a capacity ranging from 1½ to 12-inch diameter bores, requiring strokes up to 13½ feet long. This applies to the standard machine; longer or shorter stroke machines may be obtained.

Reciprocating speed is infinitely variable from 0 to 50 feet per minute and rotational speed infinitely variable from 53½ to 252 revolutions per minute. The rotational drive is mechanical while the reciprocating motion is produced hydraulically and transmitted through gearing.

Features include a sturdy work table with a working surface of 4 feet by 8 feet, insuring a solid foundation. Overall length of the machine is 27 feet and 11 inches. Length of the reciprocating stroke is adjustable by means of stop limits arranged along the machine bed to prevent overrunning, either accidentally or intentionally. These limits will not permit starting the machine in the wrong direction, regardless of what "start" is depressed.

Extreme accuracy is obtainable on small cylinders of a plus or minus 0.0002 inch on diameters. Larger bores up to the 10-inch limit may be held within 0.0005-inch on diameters.

◆ ◆ ◆

Threading Machine—

Geometric Tool Co., New Haven, Conn., is offering many improvements in its No. 12 threading machine. Hand operated for general purpose work, the unit, shown herewith, is sturdy and embodies convenient operating levers for rapid production. The machine comes with or without a lead screw, at the option of the user. As standard it is furnished without this member.

The spindle carrying the die head advances on to the work which is held stationary. Travel of the spindle is 5 inches. Although the machine does not come equipped with any work holding device the company can supply its standard screw type stationary vise mounted on a carriage. The vise is equipped with vertical and horizontal alignment adjustments. An automatic work stop is standard equipment with the vise. The unit is furnished with one set of reversible insert jaws and has a capacity ¼ to 1-inch round stock.

Either the style KD (using milled or tapped chasers) or the style TR (using tangent or circular chasers) can be furnished. Style KD is furnished unless otherwise specified.

Spindle speeds may be changed by shifting a conveniently placed lever. Four changes of speed are available. For left-hand threads, a motor arranged with reversing switch is supplied as standard when the machine is motor driven. With belt drive a special reversing countershaft is necessary.

◆ ◆ ◆

These items of industrial equipment were announced by manufacturers last week and will be described in early issues of STEEL:

Hacksaw, Marburg Bros. Inc., New York.

Chrome vanadium sockets and socket wrenches, Armstrong Bros. Tool Co., Chicago.

Composite type power shovel dippers, American Manganese Steel Co., Chicago Heights, Ill.

Annunciator units, Kellogg Switchboard & Supply Co., Chicago.

Machine for cutting pipe intersections, Oster-Williams, Cleveland.

Bolt machine, Oster-Williams, Cleveland.

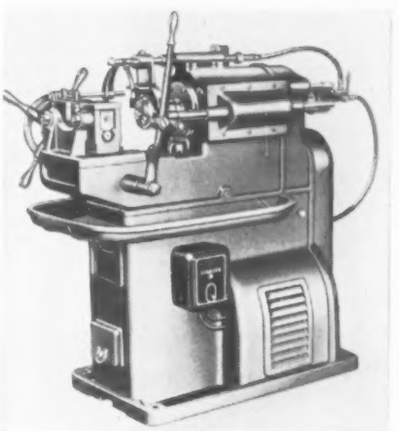
Multi-contact disconnecting switches, Schweitzer & Conrad Inc., Chicago.

Spot welder control, Clark Controller Co., Cleveland.

Blast cleaning machine, Pangborn Corp., Hagerstown, Md.

Air-operated controllers, Brown Instrument Co., Philadelphia.

Metal decorating oven, J. O. Ross Engineering Corp., New York.

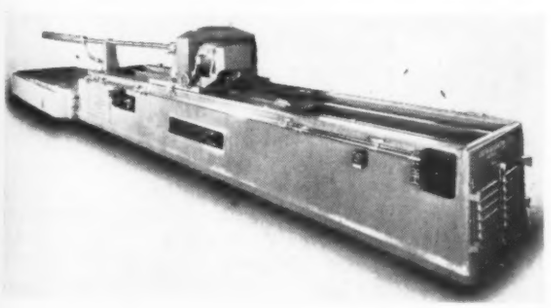


Geometric threading machine for general purpose work

Die Sinking Cutters—

Pratt & Whitney Co., Hartford, Conn., is introducing three new die sinking cutters for high speed use. These tools, shown on page 58, are known as ball end, square end and 7-degree taper cutters. Design of the helix angle, relief, etc., are such that they are able to operate in the new tough die steels at much higher spindle speeds up to 3600 revolutions per minutes.

The ball end cutters and the square end cutters are regularly furnished with right-hand cut and right-hand spiral flutes. The spiral flutes and chip clearances are of suitable angle combination to render maximum efficiency under varying conditions. Both of these types of cutters are available in 13 sizes, ranging from ⅛ to 1¼-inch in diameter exclusive. The shank diameters are



HYDRAULICALLY - reciprocated honing and lapping machine built by Hutto Engineering Co. Inc. for accurate long bore work. Reciprocating stroke ranges from a 2-inch minimum to 13½ feet maximum

the same as the diameter of cut except for the two smallest sizes which have ¼-inch shanks. The length of cut varies from ⅞ to 3¼ inches on the ball end type and varies from ⅞ to 2¾ inches on the square end cutters.

The 7-degree taper cutters are available in 12 sizes ranging from ⅛ to ½-inch inclusive. This nominal size designates the diameter of the ball at the small end. The 7-degree taper is on one side, the included angle being 14 degrees. These cutters also are regularly furnished with right-hand cut and right-hand spiral flutes. Diameters of shanks on these cutters range from ½ to 1-inch; the length of cut ranges from

Three new die sinking cutters introduced by Pratt & Whitney

1½ to 3 inches, and the overall length from 3½ to 5½ inches. This type of cutter may be used for both roughing and finishing operations. It also is supplied as a roughing cutter with nicked or gashed teeth if desired. This cutter can be furnished with a taper of 10 degrees on a side, but with other specifications unchanged.

♦ ♦ ♦

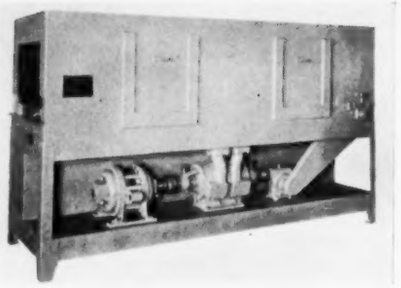
Selective Relay—

Gamewell Co., Newton, Mass., recently introduced a new selective relay, uses of which include the starting and stopping of machine equipment. In the unit governing devices are provided for controlilng the operation of the contacts. These devices are adjusted so as to give the relay a margin of safety and to guard against the relay being operated from other than a definitely timed signal. Starting mechanism is controlled by the operation of an electromagnet. The enclosure for the mechanism embodies heavy bronze side plates and has beveled edge plate glass panels at the top and ends.

♦ ♦ ♦

Washing and Drying Units—

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., is bringing out two new machines designed to wash and dry parts in process, either as sep-



Colt Autosan designed to wash and dry parts in process

arate operations or as one continuous operation. One of these units, designated model MR-8, is a standard washing and rinsing unit designed to thoroughly clean a wide variety of parts. Parts are placed on a wire mesh conveyor and automatically carried through the powerful washing and rinsing sprays.

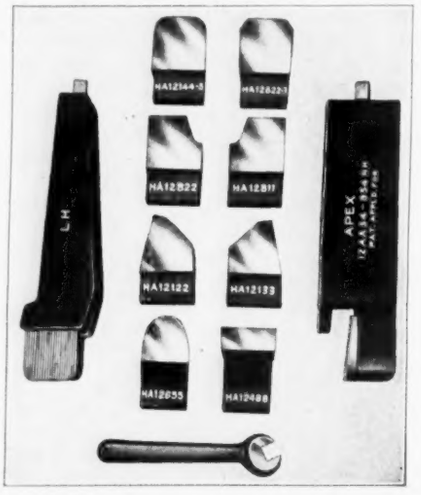
The MR-8 model, shown herewith, is equipped with outside or extended tanks, two being provided, and each having perforated scrap trays which are easily removed for emptying. Twelve tubes are provided, three above and three below in both the wash chamber and the rinse chamber. All tubes are easily removed for cleaning, without the use of tools.

The company also is calling attention to the Colt Autosan model 270 revolving type dryer, a unit that is being used in many large industrial plants throughout the country. Parts are carried through this unit by means of a revolving drum with internal fixed spiral and are continuously subjected to blasts of circulating hot air. It can be used in connection with Autosan washing units, or as a separate dryer.

♦ ♦ ♦

Heavy-Duty Tools—

Apex Tool & Cutter Co. Inc., Shelton, Conn., recently introduced a new inserted tool for planing frog



Some of the new Apex inserted tools and their holders

and switch rails, crossovers and for any general heavy machine work. The accompanying illustration shows the offset holders, both right and left-hand, with offset sufficient to enable them to be operated together. The holder is made with hardened seat with milled serrations which mate with serrations on the bottom of the tool bit. When the tool bit is placed in the holder it is locked by means of double acting draw-bolt screw, binding the tool bit securely back on the seat of the holder and mating on three sides of the slot.

All of the different shaped tool bits can be used in the holder without removing the holder from the machine, by simply releasing the lock at the top of the holder. Tool bits are forged of selected high speed steel and furnished heat-treated and ground ready for use. The tool bits can be adjusted sideways to compensate for wear.

♦ ♦ ♦

Contour Measuring Projectors

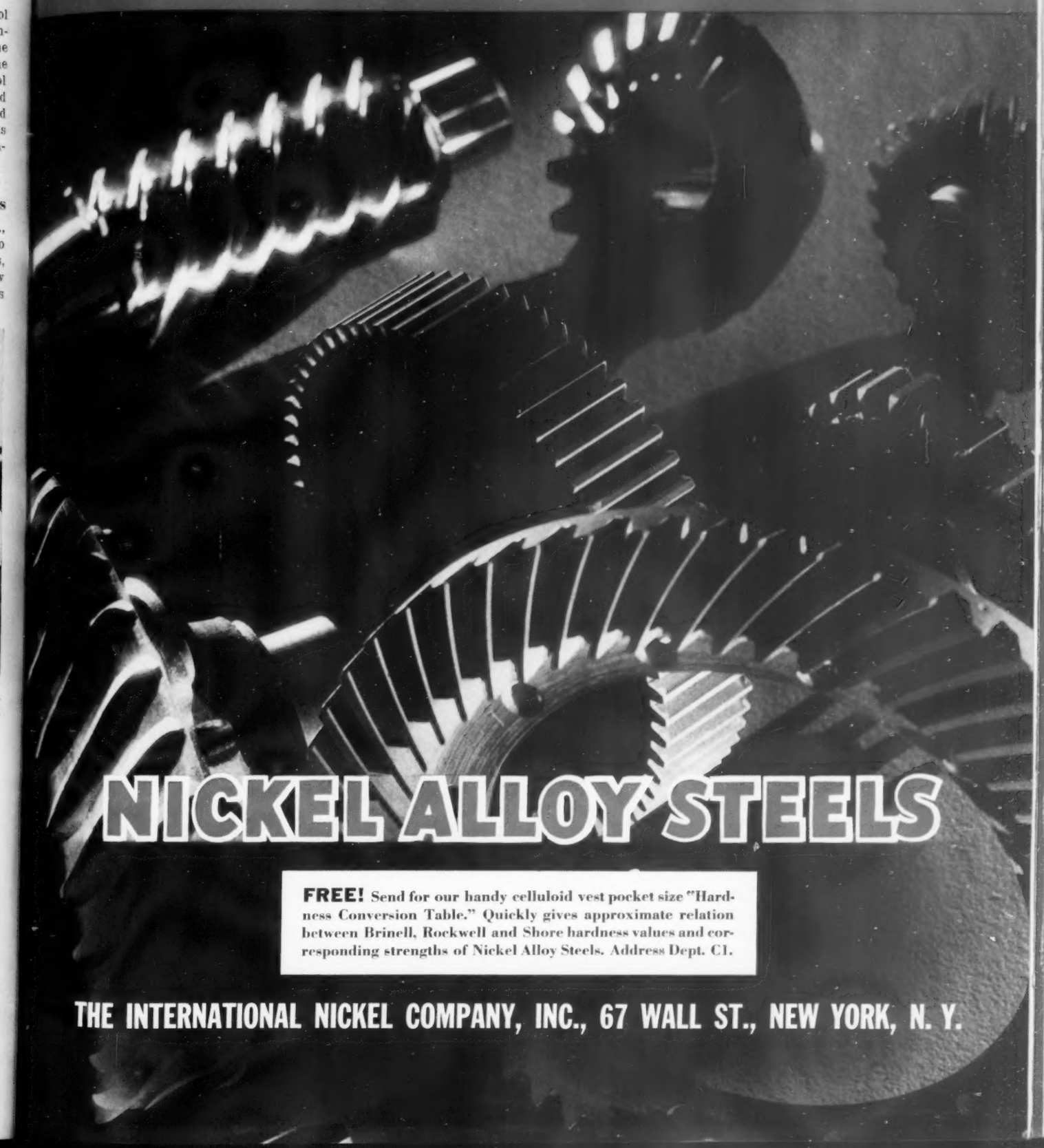
Bausch & Lomb Optical Co., Rochester, N. Y., is bringing out two new contour measuring projectors, one of which is shown herewith. New features common to both projectors

Bausch & Lomb contour measuring projector for use in the examination and inspection of mechanical parts

include a light source consisting of a new incandescent lamp with practically unlimited life and requiring no attention after installation and adjustment; a newly designed optical system providing images free from distortion and with magnification accurately rated on the lens system; a new horizontal table which eliminates the necessity of many fixtures for holding specimens; and the equal efficiency of the instruments for either visual or photographic work anywhere, without the requirement of a dark room.

The highly efficient small projector is provided with a vertical trans-

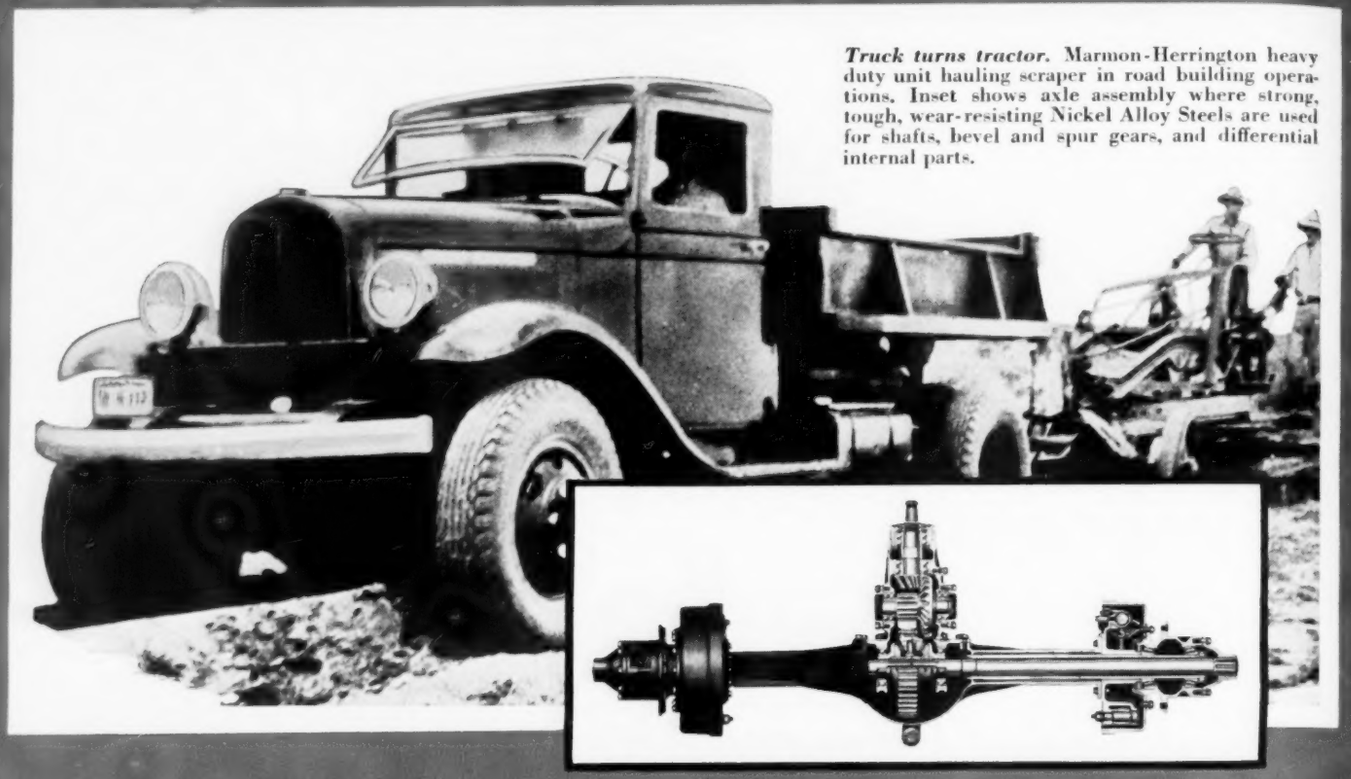
The Standard Gear Material of Industry



NICKEL ALLOY STEELS

FREE! Send for our handy celluloid vest pocket size "Hardness Conversion Table." Quickly gives approximate relation between Brinell, Rockwell and Shore hardness values and corresponding strengths of Nickel Alloy Steels. Address Dept. C1.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

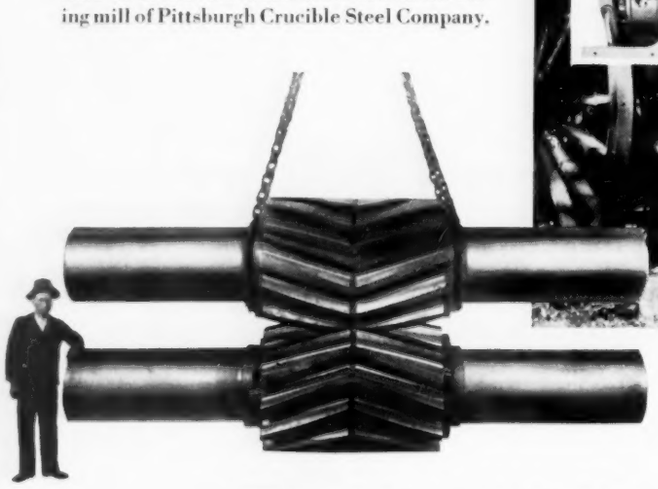


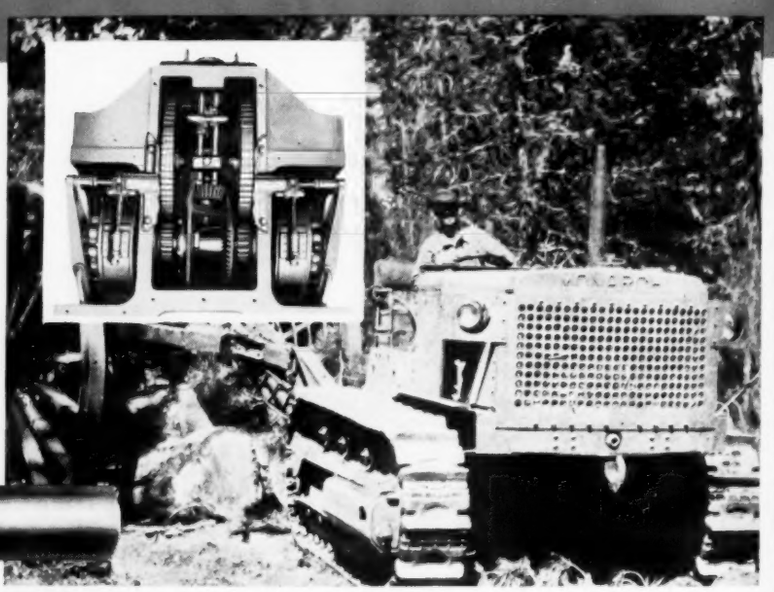
Truck turns tractor. Marmon-Herrington heavy duty unit hauling scraper in road building operations. Inset shows axle assembly where strong, tough, wear-resisting Nickel Alloy Steels are used for shafts, bevel and spur gears, and differential internal parts.

NICKEL

Reduces Breakage and Wear in Metal-to-Metal Contacts

None of your "blooming" business requires sturdier materials than pinions. This pair, weighing 80,000 pounds, are made of Nickel Chromium Steel to give greater resistance to stress and wear. Installed in blooming mill of Pittsburgh Crucible Steel Company.





Tough as a tank, this timber towboat. An Allis Chalmers Monarch "75" logging in Oregon. Inset shows transmission assembly. All gears of Nickel Alloy Steels—selected for this punishing service because of superior toughness and high resistance to stresses and wear.

FREE! Send for our handy celluloid vest pocket size "Hardness Conversion Table." Quickly gives approximate relation between Brinell, Rockwell and Shore hardness values and corresponding strengths of Nickel Alloy Steels. Address Dept. CI.

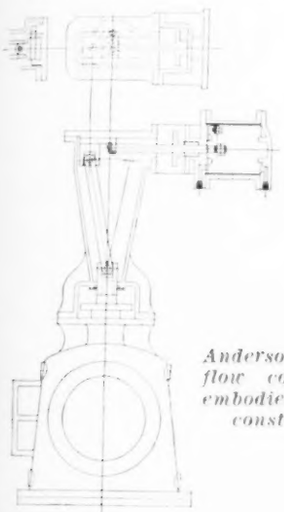
THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

lucent screen upon which the outline of an object may be traced, and an opaque horizontal screen, formed by a small retractable drawing board, upon which paper or original drawings may be attached. Image may be instantly changed from one screen to another by the shifting of a small slide. The translucent screen may be replaced by a photographic plate or by a pair of plate glasses mounted in a book form frame, between which original drawings on tracing cloth or tracing paper may be placed.

◆ ◆ ◆

Through Flow Cone Valves—

Anderson Valve Corp., Koppers building, Pittsburgh, has taken a step forward in the construction of its through flow cone valves. The new construction employs a steel housing, sealing the operating mechanism in oil to insure long life and freedom from repairs. The operating



Anderson through flow cone valve embodies unique construction

mechanism has been improved also, eliminating a number of parts and at the same time making the valve more positive and more simplified.

The valve, shown herewith, consists of a plug type cock with patented control design which permits the plug cock to be axially unseated each time before rotating the plug valve 90 degrees, without any possible friction to open or closed position. Sizes range from 6 inches up.

◆ ◆ ◆

Air Eliminator—

Gorton Heating Corp., Cranford, N. J., has announced a No. 2 air eliminator, the latest addition to its Surevent equalizing system. This device, shown herewith, was developed to meet the demand for an air eliminator that would quickly vent steam mains. It is 4 inches in diameter and 7 inches high, with a ½ inch vertical connection and a ¼ inch outlet.

The operating member is made of

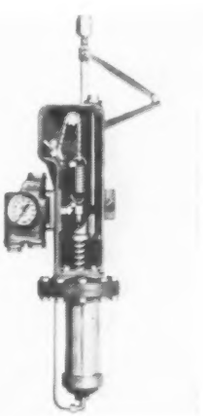
Gorton No. 2 air eliminator vents steam mains quickly

special noncorrosive thermo-metal that is extremely sensitive to heat changes. When steam or vapor enters the eliminator the heat causes the thermo-metal to expand and close the unit, holding it closed as long as there is any steam in the main. An open float closes the eliminator against slugs of water, and the large space between the float and the body of the device insures positive drainage and prevents waterlogging. This unit can be employed on one or two-pipe steam or vapor heating systems.

◆ ◆ ◆

Controllers—

A. W. Cash Co., Decatur, Ill., recently introduced a type 100 series of controllers each of which is a self contained unit comprising an actuating member, diaphragm or lever, a four-way control valve which governs the flow of water, oil, or air to a double acting power cylinder that is built into the unit as an integral part of it, a built-in compensator, and a simple range adjustment. The



The new type 100 series of Cash standard controllers

pressure responsive (or actuating) member may be a diaphragm with the controlled pressure on one side, a diaphragm with the controlled pressures on both sides, or a lever which is moved by some outside or remote means.

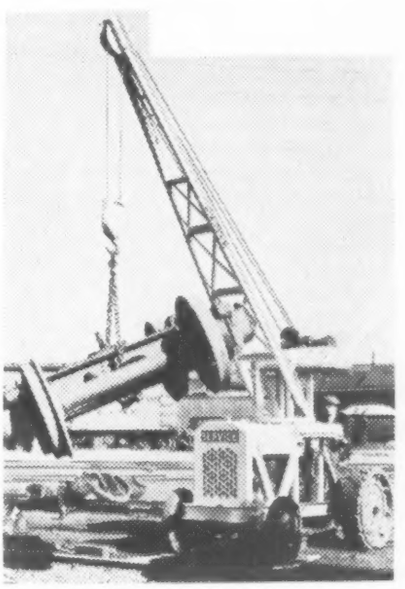
Purpose of the unit, shown herewith, is to operate balanced valves, chronometer valves, butterfly valves, dampers, regardless of size; to operate electric rheostats, stokers, pulverizers, fans, and other apparatus driven by engines, turbines or electric motors.

◆ ◆ ◆

Full Swing Tractor Crane—

Service Machine & Iron Works Inc., 1047 Magazine street, New Orleans, is building a full swing tractor crane. The machine is a single, compact unit which may be attached to most well-known tractors in the field or shop without the use of any special tools or equipment. Connection is made only to the rear axle housing and near the front end of the tractor frame to avoid any bending or torsion loads on the tractor.

The counterbalance weight never projects above the operator or ex-



Service tractor crane lifting a load weighing 6200 pounds

tends more than 8 inches beyond the rear axle at rear or side. A friction plate provided in the boom slewing mechanism allows slippage of the driving parts should the boom or counterweight accidentally encounter obstruction. Damage to the boom or drive thus is avoided.

This crane is designed to handle any load that the tractor can swing. At a radius of 8 feet the manufacturer claims the unit will safely lift loads of 8000 pounds at the front end and swing these loads to an angle of 30 degrees in either direction.

Forum on Modernization

(*Concluded from Page 45*)

same single tool capacity and requires only about one-half as much floor space.

The operator needs only to locate the parts approximately in the broaching position on the machine table and start the machine cycle by tripping a foot pedal; the machine cycle of broaching, unloading finished work, return stroke of work table and broach handling is carried out automatically without further attention from the operator.

In many automobile plants, it has been the custom to group the several machines required to produce a certain part. Such a set up may require a drilling machine, turret lathe, gear hobber and a broaching machine. It will readily be seen that the output depends upon the slowest machine in the group. As an example, the broaching machine may have a capacity of 300 pieces per hour and the gear hobber 150 pieces. Therefore, the broaching machine is used at 50 per cent of capacity. With the installation of our new broaching machine, several such groups may be served and it would be found economical to traverse the material back and forth.

The broaching art, while old, is still in its infancy so far as its potential possibilities are concerned. A great many difficult jobs are being done in various ways which if properly analyzed could be done to a distinct advantage by the broaching process.

Where Milling, Broaching Compete

One example of such a case is the finishing of the guiding keys in large gate valves. In one large plant the time required to layout and machine a 12-inch valve was three hours. A specially designed hydraulic broaching machine was built which finishes this piece in nine minutes and does the job accurately. This is external or surface broaching.

The art of surface broaching has been given serious consideration only in the past four or five years. With the recent advent of several types of such machines, manufacturers are beginning to see the possibilities of this process.

There is a distinct dividing line generally between what should be milled and what should be broached. A great many jobs which do not lend themselves to milling may be broached to advantage. In many instances, jobs which have two finished surfaces, which are held in certain relationship to each other, and which do not lend themselves to milling in one operation, can be done by the surface broaching method in one operation and held absolutely interchangeable.

A typical job is that of broaching the bearing cap pads of motor blocks. This used to be considered a milling job and as many as five milling machines and three operators were required to produce as many finished blocks as are now produced with one broaching machine and one operator. This is no reflection upon the art of milling, but it is one instance where the job lends itself more properly to broaching.

So much for the question "Can the metalworking industry afford not to replace obsolete equipment?"

Management Takes Initiative

Apropos of this discussion, I have been much impressed lately by a noticeable change in policy, in some of the larger metalworking plants, with reference to the purchase of new equipment. The almost universal policy of management in the past to wait until the supervisor could convince the superintendent of the need of new equipment, and the superintendent then to try his luck in selling the idea to the management, and frequently this procedure was repeated several times before action was finally taken.

I find now that this order is fast becoming reversed. Management is demanding that plant executives keep it advised as to the efficiency of the plant equipment, and also that they keep abreast of the times in acquiring knowledge of new developments in plant equipment. In many instances management is itself initiating the acquisition of new and up-to-date equipment which will earn a profit on the investment.

This change in policy is a healthy one and indicates management in the future is going to display increasing interest in these matters, to the end that it may keep plants in a position to produce a better product, at less cost to the consumer, and a proper return upon the capital employed.

Benefits From New Attitude

I venture the suggestion that if management will familiarize itself with plant equipment, and give it the same consideration that it does other vital elements of the business, the metalworking industry with its high percentage of obsolete equipment will soon be brought up-to-date and in the process will do its share toward increasing employment, raising purchasing power and the standard of living, and insuring a proper return on investments.

Designs Annealing Cover With Automatic Ignition

A new system of automatic continuous electrical ignition for the burners and of automatic shutoff of fuel for the Wilson-type annealing covers is announced by the Wean Engineering Co. Inc., Warren, O. The new system developed by the Lee Wilson Engineering Co., Cleveland, makes possible the lighting of a cover merely by throwing a switch and opening one gas valve. Should the power fail, the gas automatically is cut off and cannot be turned into the furnace again without manual setting.

The electrical ignition system greatly reduces the time necessary for changing covers from one batch to another; eliminates the possibility of burners not being lighted; and aids in obtaining more rapid and uniform annealing. The ignition system is of particular advantage where exhaust systems are connected to the exhaust end of the burner tubes and eliminates the danger of the exhaust system extinguishing the flame.

Trade Publications

Retail Survey—Dun & Bradstreet Inc., East Ohio Gas building, Cleveland. A survey of retail trade based on 1934 figures, covering 140 divisions of trade.

V-Belt Drive—Gates Rubber Co., Denver. DH-300, a guide for selecting and designing V-belt drives, planned to give complete information on all phases of belt drive.

Welding Wire—Williams & Co. Inc., 901 Pennsylvania avenue, Pittsburgh. Price list No. 835, effective Aug. 1, covering its welding wire and specialties.

Drills, Tools — Standard Tool Co., Cleveland. Catalog No. 34 describing its twist drills, reamers, taps, milling cutters, drill chucks and other specialties.

Jig Borer—Pratt & Whitney Co., Hartford, Conn. Circular No. 412 on its No. 2A jig borer, explaining the wide diversity of uses, with economy of expense.

Plating—Udylite Co., 1651 East Grand boulevard, Detroit. A leaflet on its small plating device with detachable cylinder for plating small lots of material economically.

Power Squaring Shear — Niagara Machine & Tool Works, Buffalo. Bulletin No. 72-E, describing power squaring shears for $\frac{5}{16}$-inch material and lighter, and automatic holddown.

Protective Hats—Mine Safety Appliance Co., Pittsburgh. A bulletin describing its line of heat protectors in hat and cap form, of special micarta, explaining advantages over metal.

Steel Rate Up to 48, but Market Is Quieter

Automotive Releases Awaited; Easier Tone In Scrap at Pittsburgh

MARKET IN TABLOID

DEMAND *. . . Slightly slower.*

PRICES *. . . Iron, steel steady; scrap composite up, but Pittsburgh easier.*

PRODUCTION *. . . Ingots up 1 point to 48 per cent; full-finished sheets up 6 points to 61; tin plate 85.*

SHIPMENTS *. . . Lighter.*

WHILE steelworks operations advanced one more point to 48 per cent last week, new commitments were in lighter volume, and steelmakers believe the current rate represents a peak in the rise which has been under way since the first week in July.

Although opinion in the industry is that the industrial improvement has gained too much momentum to be checked, except temporarily, the steelworks rate is expected now to move in a lateral direction before a further gain.

The current leveling-off in orders is due mainly to interruptions in the automobile industry which last week experienced one of the sharpest declines in output this year, assembling only 48,600 cars, or 20,800 less than in the preceding week. Preparatory to its transition to new models, the industry has placed large tonnages, and releases on these are expected late this month.

Steel's sensitivity to automobile manufacture never was more apparent. An exceptionally high proportion of finished steel produced this year has gone into automobiles, estimated as 30 per cent. Automobiles absorbed only 20 per cent, as an average in the prior three years, and only 15.4 per cent in the years 1925-30 when steel distribution was "normal." That industry now has made more cars this year than it did in all 1934, while finished steel output for seven months is only slightly higher than in the first seven last year.

As 65 per cent of automobile assemblies usually fall in the first six months of the year less tonnage is expected from that source over the next four months. Neither railroads nor construction work has called for as large tonnages as last year. Railroad buying is not particularly promising, and the federal works relief plans have not yet put material orders on books.

Farm implement and equipment manufacture is expected to carry through this year at a high rate, with operations 75 per cent of 1928-30. Led by rural buying, black and galvanized sheet production is up to 65-70 per cent, and output of full-finished sheets, largely for automobiles, has advanced 6 points to 61 per cent.

While scrap price rises in some districts have advanced STEEL's scrap index another 25 cents to $11.88, highest since April, 1934, shipping suspensions from Pittsburgh steelworks have eased the market there.

Better plate demand is in prospect for industrial plant work, particularly in the oil industry. The navy has opened bids on 13 vessels requiring 30,000 tons of steel. Raymond City Coal Co., Cincinnati, awarded 24 barges to Marion Steam Shovel Co., Marion, O., taking 3672 tons.

Structural shape awards increased to 21,260 tons. Some small, miscellaneous orders for rails were placed, but larger inquiries for car materials and rolling stock came from South America, Mexico and the Far East. New York's board of transportation has awarded $2,000,000 worth of railway equipment to Westinghouse Electric & Mfg. Co. Machine tool and equipment builders continue to make substantial purchases of steel bars, plates and other items.

In accordance with their custom under the steel code, steelmakers expect to announce prices for fourth quarter Aug. 22. Opinion in the industry is general that they will be reaffirmed.

Daily average steel ingot production in July was 87,316 gross tons, compared with 89,236 tons in June. The additional working day, however, gave July a total of 2,270,224 tons, up from 2,230893 tons in June. For seven months this year output is 18,294,915 tons, 2.2 per cent over last year.

Steelworks operations in the Chicago district last week increased 1 point to 53 per cent; Wheeling 3 to 79; Cleveland 8 to 62; Birmingham 4 to 35½; New England 20 to 45. Youngstown was down 2 to 51; Detroit 6 to 88. Pittsburgh held at 41; Buffalo 37; eastern Pennsylvania 31½.

STEEL's iron and steel price composite has advanced 5 cents to $32.64, due to scrap, while the finished steel index remains $54.

COMPOSITE MARKET AVERAGES

	Aug. 10	Aug. 3	July 27	One Month Ago July, 1935	Three Months Ago May, 1935	One Year Ago Aug., 1934	Five Years Ago Aug., 1930
Iron and Steel	$32.64	$32.59	$32.55	$32.44	$32.35	$32.24	$32.90
Finished Steel	54.00	54.00	54.00	54.00	54.00	54.00	51.72
Steelworks Scrap	11.88	11.63	11.25	10.64	10.27	9.98	12.62

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Aug. 10, 1935	July, 1935	May, 1935	Aug., 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.80c
Steel bars, Chicago	1.85	1.85	1.85	1.85
Steel bars, Philadelphia	2.11	2.11	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60

Semifinished Material

Sheets bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	Aug. 10, 1935	July, 1935	May, 1935	Aug., 1934
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.80	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.30	19.26
No. 2, foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.5
No. 2X eastern, del. Philadelphia	20.68	20.68	20.68	20.
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.25	24.25	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.66	18.83

Scrap

Heavy melting steel, Pittsburgh	$13.25	$12.30	$12.00	$11.45
Heavy melt. steel, No. 2, east. Pa.	9.75	9.55	9.25	8.45
Heavy melting steel, Chicago	12.25	10.40	10.20	9.25
Rails for rolling, Chicago	13.75	11.25	11.05	10.50
Railroad steel specialties, Chicago	13.25	12.00	11.40	10.25

Coke

Connellsville, furnace, ovens	$3.25	$3.30	$3.60	$3.60
Connellsville, foundry, ovens	4.00	4.25	4.60	4.60
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90
Detroit, delivered	1.95
Pacific ports, f.o.b. cars, dock	2.35
Philadelphia, del.	2.1
Boston, delivered	2.2
New York, del.	2.1
*Pitts., forg. qual.	2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail xtras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
100 0.80-1.10 Cr.....0.45
100 Cr. spring.....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23/4-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	85-10 off
Upset, 1-in., smaller	87½ off

Square Head Set Screws

Upset, 1-in., smaller	80 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.25- 3.40
Connellsville, fdry.	4.00- 4.10
Connel. prem. fdry.	5.00- 5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		15.00c
Toluol		30.00c
Solvent naphtha		30.00c
Commercial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25
Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.25
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25, 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality.

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.,	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%, 105.00	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.[illegible]
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Aug. 3	8.00	8.12½	7.50	52.55	51.05	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 5	8.00	8.12½	7.50	52.55	50.95	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 6	8.00	8.12½	7.50	52.35	50.40	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 7	8.00	8.12½	7.50	52.37½	50.50	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 8	8.00	8.12½	7.50	52.10	50.25	4.20	4.05	4.50	*19.00	13.00	35.00
Aug. 9	8.00	8.12½	7.50	51.62½	49.55	4.20	4.05	4.50	*19.00	13.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	13.62½
Copper, hot rolled	15.00
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	15.37½
Seamless copper	15.25
Rods	
High yellow brass	12.12½
Copper, hot rolled	12.25
Anodes	
Copper untrimmed	12.75
Wire	
Yellow brass (high)	14.12½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	4.75- 5.00
Cleveland	5.00- 5.25
Chicago	4.50- 4.75
St. Louis	4.50- 4.75
Heavy Copper and Wire	
*New York, No. 1	6.00- 6.25
Chicago, No. 1	5.75 6.00
Cleveland	5.50- 5.75
St. Louis, No. 1	6.00- 6.25
Light Copper	
New York	4.75- 5.00
Chicago	4.12½-4.37½
Cleveland	4.75- 5.00
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
St. Louis	2.25- 2.50
Lead	
New York	3.12½- 3.25
Cleveland	3.00- 3.25
Chicago	2.87½-3.12½
*St. Louis	3.30- 3.45
Zinc	
New York	2.00- 2.25
Cleveland	2.00- 2.25
*St. Louis	2.85- 3.00
Aluminum	
Borings, Cleveland	7.50- 8.00
*Mixed, cast, Clev.	12.00-12.25
Mixed, cast, Clev.	12.00-12.25
Clips, soft, Cleve.	13.50-14.00

SECONDARY METALS

Brass ingot, 85-5-5-5	8.00
Stand. o. 12 alum.	16.25

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.75- 9.00
Boston, domestic	7.25- 7.50
Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.00-12.50
Cleveland, No. 1	11.25-11.75
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.25- 9.75
Detroit, No. 2	7.75- 8.25
Eastern Pa., No. 1	11.00
Eastern Pa., No. 2	10.00-10.50
Federal, Ill.	8.50- 9.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.25- 7.75
N. Y., deal, No. 2	7.50
N. Y., deal. barge	8.50
Pittsburgh, No. 1	13.00-13.50
Pittsburgh, No. 2	11.25-11.75
St. Louis	7.50- 8.00
Valleys, No. 1	12.75-13.25

COMPRESSED SHEETS

Buffalo, dealers	10.50-11.00
Chicago, factory	11.00-11.50
Chicago, dealer	10.25-10.75
Cleveland	11.00-11.50
Detroit	9.75-10.25
E. Pa., new mat.	10.00-10.50
Pittsburgh	13.00-13.50
St. Louis	6.25- 6.75
Valleys	12.50

BUNDLED SHEETS

Buffalo	7.25- 7.75
Cincinnati, del.	7.00- 7.50
Cleveland	9.50-10.00
Pittsburgh	11.00-11.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.50- 7.00
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	13.00-13.50
Chicago (3 ft.)	14.00-14.50
Chicago (2 ft.)	14.50-15.00
Cincinnati, del.	12.00-12.50
Detroit	11.50-12.00
Pitts., open-hearth, 3 ft. and less	15.00-15.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.50- 8.00
Chicago	12.00-12.50
Pittsburgh	13.25-13.75
St. Louis	10.25-10.75
Buffalo	11.50-12.00

STOVE PLATE

Birmingham	5.75- 6.00
Boston, dealers	3.50- 3.75
Buffalo	9.50-10.00
Chicago, net	7.00- 7.50
Cincinnati, dealers	6.50- 7.00
Detroit, net	6.50- 700
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	13.00-13.50
Eastern Pa.	13.50
Pittsburgh	15.00-15.50
St. Louis	10.50-11.00

ANGLE BARS—STEEL

Chicago	13.00-13.50
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	13.00-13.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	14.50-15.00
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.00-14.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	10.25-10.75

SHOVELING STEEL

Chicago	12.00-12.50
Federal, Ill.	8.50- 9.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.25-10.50
Buffalo, No. 2	11.25-11.75
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	12.00-12.50
Cincinnati, No. 2	9.00- 9.50
Eastern Pa.	11.00-11.50
N. Y., No. 1, deal.	7.50- 8.00
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	8.50- 9.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.50-11.00
Cinci., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	7.00- 7.50
Detroit, No. 1, new	8.00- 8.50
Valleys, new, No. 1	12.00-12.50

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	2.25- 2.50
Buffalo	6.00- 6.50
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	6.50- 7.00
Detroit	5.00- 5.50
Eastern Pa.	6.00- 6.50
New York, dealers	3.00- 3.25
Pittsburgh	8.50- 9.00
St. Louis	2.25- 2.75
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	6.75- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	7.00- 7.50
Detroit	5.25- 5.75
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	7.00- 8.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	6.75- 7.00
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.00- 7.50
Detroit	5.25- 5.75
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	2.00- 2.50

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	6.50- 7.00
Cincinnati	4.50- 5.00
Eastern Pa.	8.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.50- 5.75
Buffalo	10.50-11.00
Cleveland	9.50-10.00
Detroit	7.50- 8.00
Pittsburgh	11.00-11.50

FORGE SCRAP

Boston, dealers	4.50
Chicago, heavy	13.00-13.50
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	10.50-11.00
Chicago, elec. fur.	11.50-12.00
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	7.00- 7.50

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.50-13.00
Chicago, net	14.25-14.75
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	12.25-12.50
Eastern Pa.	17.50
New York, dealers	13.25-13.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00-10.00
Boston, iron deal.	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	12.75-13.25
Chicago, iron	12.00-12.50
Chicago, rolled steel	13.00-13.50
Cincinnati, iron	9.50-10.00
Eastern Pa., iron	11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	8.50- 9.00
St. Louis, steel	11.50-12.00

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	11.00-11.50
Buffalo, mach.	11.50-12.00
Chicago, agri. net	9.00- 9.50
Chicago, auto	10.00-10.50
Chicago, mach. net	10.50-11.00
Chicago, railr'd net	10.00-10.50
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	11.75-12.25
Detroit, net	10.00-10.50
Eastern Pa., cupola	11.00-12.00
E. Pa., mixed yard	9.50-10.00
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	9.00- 9.50
Cleveland, break.	10.00
Detroit, No. 1, mach. net	10.25-10.75
Detroit, break.	8.50- 9.00
Detroit, auto net	10.50-11.00
Eastern Pa.	10.50
N. Y., break. deal.	6.25- 6.50
Pittsburgh	12.00-12.50

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	12.00-12.50
Buffalo	13.00-13.50
Chicago, R. R.	13.75-14.25
Cincinnati, agri. del.	9.50-10.00
Cleveland, rail	14.50-15.00
Detroit, auto	11.50-12.00
St. Louis, R. R.	10.75-11.25
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	11.00-11.50
Chicago	13.50-14.00
Eastern Pa.	12.50-13.00
New York, dealer	8.50- 9.00
St. Louis	11.00-11.50

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.50-13.00
Chicago	14.00-14.50
Eastern Pa.	13.00-14.00
Pittsburgh (heavy)	14.50-15.00
Pittsburgh (light)	14.00-14.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00-10.50
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.00

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.95c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.04c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.26c
Pittsburgh (h)	2.90c
Philadelphia*	2.93c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.20c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.07c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.50c
New York	4.50c
Philadelphia*†	4.30c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.58c
Boston	3.75c-3.90c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c-4.31c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, August 8

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.50 3 2 6	$13.72	1 14 0
Basic bessemer	15.50 3 2 6*	12.91	1 12 0
Hematite, Phos. .03-.05	16.35 3 5 6	.....	.....
SEMIFINISHED STEEL			
Billets	$27.28 5 10 0	$18.98	2 7 0
Wire rods, No. 5 gage	42.16 8 10 0	36.38	4 10 0
FINISHED STEEL			
Standard rails	$38.44 7 15 0	$36.34	5 10 0
Merchant bars	1.66c 7 10 0	1.14c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.63c 7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.77c 8 0 0	1.54c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.04c 9 5 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.40c 11 5 0	3.1⅔c	8 15 0
Bands and strips	1.88c 8 10 0	1.45c	4 0 0
Plain wire, base	2.04c 9 5 0	1.85c	5 7 6
Galvanized wire, base	2.38c 10 15 0	2.28c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.65c 12 0 0	2.10c	5 15 0
Tin plate, box 108 lbs.	$ 4.46 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Sdy. pig iron, Si. 2.5	$16.74 3 7 6(a)	$17.24	260	$12.51	370	$25.44 63
Basic bessemer pig iron	17.36 3 10 0(a)*	12.55	190	11.15	330	28.06 (b)69.50
Furnace coke	4.09 0 16 6	7.96	120	3.72	110	7.67 19
Billets	27.28 5 10 0	28.51	430	18.25	540	38.97 96.50
Standard rails	1.82c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.90c 8 12 0	1.68c	560	.90c	600	2.01c 110
Structural shapes	1.93c 8 15 0	1.65c	550	.90c	600	1.97c 107.50
Plates, †¼-in. or 5 mm.	2.00c 9 1 3	2.20c	700	1.05c	700	2.32c 127
Sheets, black	2.32c 11 0 0§	1.86c	620‡	1.24c	825‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.87c 13 0 0	3.45c	1,150	2.25c	1,500	6.77c 370
Plain wire	2.04c 9 5 0	3.39c	1,130	1.73c	1,150	3.17c 173
Bands and strips	2.07c 9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 65.3 per cent over paper sterling.

Bars

Bar Prices, Page 64

Pittsburgh — Revised bar card which went into effect Aug. 10, finds the following round and square size extras now quotable: 1 9/16 to 2 1/16, 10 cents up; 2⅛ to 3 1/16-inch, 15 cents; 3⅛ to 4 9/16, 20 cents. Size extras on bars from 3/16 up to 47/64-inch are unchanged, as of the former bar card. On flats, square edge and round edge, revised extras go into effect on the wider and thicker sections in the five width classifications from 2 9/16 to 6 inches, and in the three thickness classifications from 1 1/16 to 4 inches. The effect of this advance in size extras is to recompense producers for increased manufacturing costs on former base sizes and is having the effect in the market of some stocking by consumers. Of heavier tonnage consequence, however, is the volume of bar buying from the automotive trade, which has been entered on mills' books but not yet released. Buyers' releases should be issued by another two weeks.

Cleveland — Shipments of steel bars so far this month for leading interests here are 40 to 50 per cent larger than in the comparable period in July, accounting in a measure for the Cleveland producer's rapid increase in ingot production recently. Orders from automobile forgers, machine tool builders and equipment manufacturers have increased. Hudson Terraplane has placed a contract with a Cleveland manufacturer for all of its bumper sections for 1936 models. Electric Auto-Lite Co., Toledo, O., has purchased the Central Brass & Fixture Co., Springfield, O., and it is reported all Chrysler bumpers will be produced at this plant.

Chicago—Bar demand easily holds recent gains as a result of continued active participation in the market by miscellaneous consumers. The latter have been largely responsible for gains in total buying the past six weeks, though farm implement manufacturers hold at a steady consuming rate. While automotive demand principally is for material to complete the run on present models, some business is being placed for the new series and partsmakers shortly are expected to be taking larger tonnages. Local bar producers have adopted new extras on forging material.

Boston—Except for forging quality material, bars are slightly more active. Elimination of the $5 extra on forging quality, effective Aug. 10, held back some forging shop orders last week. Demand for commercial steel, alloy and cold-finished bars is steady and slightly broader, although buying is generally for needs during the next few weeks. Buying by boltmakers continues at the recent slightly improved rate. From Sweden, 145 tons of steel bars were imported at the Boston customs district, during July.

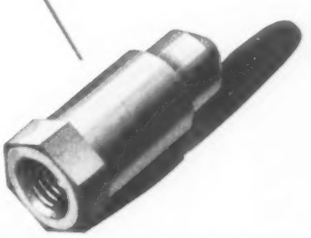
Philadelphia—With new extras scheduled to go into effect Aug. 10, jobbers and general users of bars are endeavoring to protect themselves against the advance in premiums on widths. Forging interests, on the other hand, are showing a disposition to hold off until after Aug. 10 to take advantage of the reduction in forging extras. The Frankford arsenal, Frankford, Pa., closed bids last week on 150 tons of cold-finished bars. The base price on commercial steel bars is steady at 1.80c, Pittsburgh, or 2.11c, Philadelphia.

New York—A somewhat livelier interest is being noted in commercial steel bars, with jobbers in particular seeking protection against the advance in width extras, effective Aug. 10. Sellers generally look for sustained interest throughout the greater part of the month with an upward swing in the fall.

AQUAPLANING is the ace of water sports, and there's a "thrill-a-second" in trailing a speed-boat at a mile a minute through clouds of spray.

And B & L Ultra-Cut is the "Ace of Machining Steels," which is setting new records in pieces per hour for the manufacture of finely finished machine parts.

It is developed for the express purpose of increasing the output of automatic screw machines without sacrifice of quality in the finished product. It enables you to get more from your present equipment, and to take advantage of the higher speeds for which the newer types of machines are built. Ask for your copy of the Ultra-Cut Folder No. 3-S.



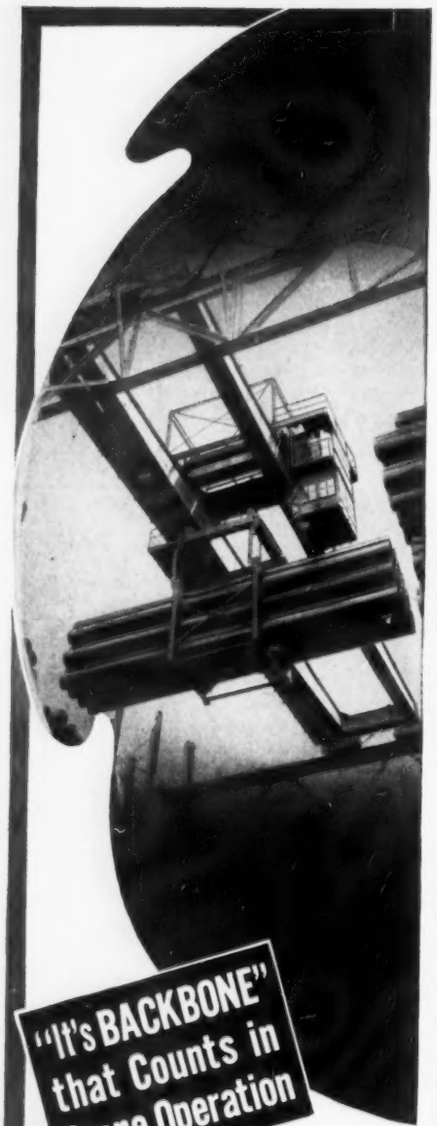
Fabricated from ⅞" hexagon Ultra-Cut Steel at a cutting speed of 257 S.F.M. Time per piece 4½ seconds. Finer finish obtained and tool life increased 20% by substituting Ultra-Cut for the former screw stock.

BETTER MADE STEELS LABORATORY TESTED

COLD DRAWN BARS AND SHAFTING ● ULTRA-CUT STEEL ● FREE-CUTTING SCREW STOCK ● EXTRA WIDE FLATS ● SPECIAL SECTIONS ● ALLOY STEELS

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* **BUFFALO, N.Y.**



Rigid girder construction decides largely how your crane stands up under long years of hard service. The distortion or weaving that results from inability to carry stresses means ultimate crane failure.

In P&H Crane Girders, ALL common causes of material "stretching" due to punching have been eliminated. All rivet holes are drilled . . . perfectly aligned. It's modern advanced equipment and single manufacturing responsibility that give you these extra features at no higher cost.

Harnischfeger engineers offer you a wealth of experience in material handling application. Bulletin 450 will give you the story of P&H Cranes. Write for it.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H TRAVELING CRANES

—The Market Week—

Plates

Plate Prices, Page 64

Philadelphia — Sun Shipbuilding Co., Chester, Pa., has been awarded the contract for building the ferryboat for the Virginia Ferry Corp., subsidiary of the Pennsylvania, requiring approximately 1000 tons of plates, shapes and bars. Recent opening of bids on the 13 navy craft, involving approximately 24,225 tons of steel, revealed that no yards in this district figured. The Bethlehem Shipbuilding Co., Bethlehem, Pa., appears low on the airplane carrier, requiring about 13,000 tons of steel; Newport News Shipbuilding & Dry Dock Co., Newport News, Va., on the light cruiser, requiring 6000 tons; and the Bath Iron Works, Bath, Me., on the three 1850-ton destroyers, each requiring approximately 375 tons; and the Electric Boat Corp., Groton, Conn., on the three submarines, each taking 150 tons. Low bidder on the five 1500-ton destroyers is not yet known, due to the many alternates on this type of boat.

Report is current here that the Newport News Shipbuilding & Dry Dock Co. will start soon on the construction of a new liner for International Mercantile Marine-Roosevelt Steamship Co., the third to be built in this country in recent years for this company. A large number of tankers continue in prospect for construction over the next two years, although the only two sizable ones pending at the moment are the two for the Gulf Refining Co., on which the Sun Shipbuilding Co., Chester, Pa., is low bidder. A substantial tonnage of plates and other steel products should be released by the New York Shipbuilding Co., Camden, N. J., for navy work now on its ways, as soon as labor trouble, which has tied up operations for more than three months, is fully adjusted.

An improvement in small miscellaneous tank and boiler work is noted, with one district fabricator starting on night shift this week. Plates are unchanged at 1.90c, Coatesville, Pa., or 1.99½c, Philadelphia.

Pittsburgh—Raymond City Coal Co., Cincinnati, has placed an order for 24 steel coal barges with the Marion Steam Shovel Co., Marion, O., involving about 3672 tons of steel. Seventy per cent of this tonnage or 2570 tons, is in plates, mainly 5/16 and ⅜-inch thickness, and the remainder, 1102 tons, is in structural shapes, mainly channels, which are reported to have been placed with Carnegie Steel Co., Pittsburgh. Entrance of the Marion Steam Shovel Co. into the barge field marks an innovation. The barges, each 175 x 26

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x 11 feet, will be fabricated at Marion, O., and shipped overland to Jeffersonville, Ind., where they will be assembled. Orders for about 2950 tons of plates are being placed by Dravo Contracting Co., Neville Island, Pittsburgh, for the construction of two Ohio river towboats (700 tons) and ten barges (each 225 tons of plates) to be built for the Ohio River Co., Cincinnati. The plate market is quoted unchanged at 1.80c, base, Pittsburgh.

Cleveland—Elyria, O., will take bids this week on a 5-mile, 30-inch steel water pipe, requiring approximately 5000 tons of plates, the largest public works project of this type in this district in many months, and also on a 1,000,000-gallon elevated water tank, taking 500 tons of plates and shapes. The market for miscellaneous, carload orders is more active.

Chicago—Better plate demand is in prospect for industrial plant work, particularly in the oil industry. Plate orders for structural work are moderately heavier, with fairly large tonnages required for locks and dams on the Mississippi river. Contracts for these units now are being distributed. Railroads are taking only small tonnages for repair shops.

Boston—With large tank inquiry heavier and miscellaneous plate demand in small shipments holding well, shipbuilding requirements loom encouragingly with the apparent success of New England bidders for navy contracts Aug. 7. Bath Iron Works, Bath, Me., is low on three 1850-ton destroyers, taking about 2100 tons of plates, 1080 tons shapes, and 360 tons, bars. Electric Boat Co., Groton, Conn., is low on three submarines, taking 1080 tons of plates, 540 tons of shapes, and 189 tons of bars. Should the aircraft carrier, on which the Bethlehem Shipbuilding Co. is low on one alternate, be built at Quincy, Mass., tonnage involved in the opening on which New England yards are low totals about 12,000 tons or two-thirds of the plate requirements for the 13 ships. In addition, the Bath, Me., yard is low on some of the alternates on the five 1500-ton destroyers. Added to the substantial volume pending for oil and fuel tanks are several hundred tons for a terminal at New Haven, Conn., for the Atlantic Refining Co. Prices are steady at 2.22c, Boston.

New York—Some oil company tonnage is expected to be placed here shortly, with improvement also noted in miscellaneous tank and boiler demand. Alco Products Inc. is reported to have received a release on the 1160 tons of fabricated steel pipe for the city of Buffalo, which has been held for almost three months. Base prices are unchanged.

Bureau of supplies and accounts, navy department, Washington, will issue specifications shortly for eleven vessels to be built in navy yards.

San Francisco—The largest plate award went to Steel Tank & Pipe Co., Berkeley, Calif., 350 tons for a 20 and 28-inch welded steel pipe line for the Yellowstone National Park in Montana. Berkeley Steel Construction Co., Berkeley, Calif., booked 162 tons for the Broadway tunnel, Oakland, Calif.

Seattle—Improved prospects for plates are apparent as larger projects begin to materialize. Everett, Wash., officials state plans are about ready for a $125,000 water main extension, 17,000 feet in length. Lake Washington Shipyards, Seattle, has been awarded the general contract for a 117-foot steel survey craft for the United States engineer, Portland, Oreg., requiring 145 tons of plates and shapes. Local bidders are figuring on a 105-foot steel yacht for Charles Chaplin, calling for 125 tons. Bids are to be opened about Aug. 15.

Contracts Placed

3672 tons, 24 steel coal barges, each 175 x 26 x 11 feet, for Raymond City Coal

"A.W." *Super-Diamond for* THE U.S. NAVY

Uncle Sam's "watch dogs" are now using the new "AW" Super-Diamond Pattern! A typical choice—emphasizing the desire to provide the Navy with every safeguard. For "AW" floor plates *are* safe—and permanent.

Be sure your floor plates are really safe—specify "AW" plates. Also available in the reliable standard *Diamond* and *Diamondette* patterns—ferrous and non-ferrous metals.

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Co., Cincinnati, to Marion Steam Shovel Co., Marion, O.

2950 tons, two towboats, each requiring 350 tons, and ten 195-foot coal barges, each requiring 225 tons, for Ohio River Co., Cincinnati, to Dravo Contracting Co., Neville Island, Pittsburgh.

1255 tons, nine tanks, Pan-American Petroleum & Transport Co., Albany, N. Y., to Chicago Bridge & Iron Works, Chicago.

1190 tons, 36-inch steel pipe, Buffalo, to Alco Products Co., Dunkirk, N. Y.

350 tons, 20 and 28-inch welded steel pipe, national park service, Yellowstone park, Montana, to Steel Tank & Pipe Co., Berkeley, Calif.

335 tons, nine tanks, terminals in Maine and New York, seven in former state, for Shell Eastern Petroleum Products, 270 tons to Buffalo Tank Corp., New York, and 65 tons to Hammond Iron Works, Warren, Pa.

315 tons, welded pipe, division A, sewage works, Chicago, to Taylor Forge & Pipe Works, Chicago.

162 tons, Broadway tunnel, Oakland, Calif., to Berkeley Steel Construction Co., Berkeley, Calif.

160 tons, 500,000-gallon elevated tank, Sea Cliff Water Co., Long Island, N. Y., to Tippett & Wood, Phillipsburg, N. J.

Contracts Pending

5500 tons, Elyria, O., waterworks; bids this week; includes 5000 tons for 5-mile 30-inch, ¼-inch thick, pipe, and 500 tons of plates and shapes for 1,000,000-gallon elevated water tank.

200 tons, Proctor & Gamble, Cincinnati, for two silos, Staten Island, N. Y.

148 tons, siphon, Fraser River dam for city of Denver; bids opened.

145 tons, including shapes, 117-foot survey diesel craft for United States engineer, Portland, Oreg.; Lake Washington Shipyards, Seattle, general contractor.

Behind the Scenes with STEEL

Looking Back

HOW were things 50 years ago? Well, *Iron Trade Review* (granddaddy of STEEL) reported that: "Recent revolutions in iron and steelmaking have caused an exodus from various branches of the trade to other departments of industry, but this little incident related by a Sharon, Pa., correspondent puts a new phase on the subject: 'The hard times are causing our workmen to devise new schemes of economy. Last Saturday two or three of the most skillful ones procured a razor, shears, soap, etc., and opened up a tonsorial parlor under the blue canopy of heaven at a point in the northern part of the city. The result was 33 shaves and 15 haircuts.' Why not? Rolling mill men ought to be familiar with shearing, cutting, cropping and trimming."

Warner & Swasey advertised a very fine brass working machine. Pope Mfg. Co. showed cuts of bicycles and tricycles "for ladies and gentlemen." "The popular steeds of today," they called them.

* * *

On the Jump

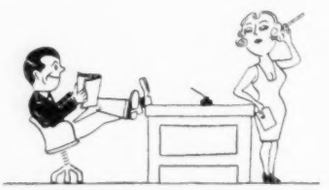
OPEN season on industrial expositions and technical congresses will start with much eclat Aug. 19 when the American Foundrymen's association swarms down on Toronto for a few days of idea-volleying.

Then they start coming thick and fast. The Machine Tool Show in Cleveland Sept. 11, which reports say is to be nothing short of colossial, stupendious and other Durante-adjectives. A short breathing spell and the Association of Iron and Steel Electrical Engineers descends on Pittsburgh for its annual conclave Sept. 24. No sooner is this affair out of the way than the 17th National Metal Congress and Exposition throngs to Chicago.

This annual roundup is a regular five-ring circus, in the respective rings being the American Society for Metals, American Institute of Mining and Metallurgical Engineers, Wire association, American Welding society and the National Metal exposition. It starts Sept. 30.

Things quiet down then for a while until Nov. 12 when the International Acetylene association convenes in Cleveland.

The problem resolves itself into how a man whose interests lie with all these worthy affairs can manage to take them in and at the same time keep an eye on Miss Swithins, the new blonde stenographer in his office. The best way we know is to turn the job over to the editors of STEEL who say they take great delight in hot-footing it around the country to report complete details of all these meetings. So just sit back and put your No. 11's on the desk, smile at Miss Swithins and read STEEL carefully over the



next few weeks. It's the equivalent and better of a front row seat at all conventions and exhibitions in which you are interested, saves plenty railroad fare, and avoids those post-convention two-aspirin headaches.

* * *

Blue Funk

BOB (Homespun Philosophy) Kinkead says that if a man has the two affirmative convictions — "The world needs me" and "My job is important"—he becomes socially adjusted and economically productive. Great stuff, but sometimes, usually about 9 o'clock on Monday mornings, we're quite sure we are socially maladjusted and economically nonproductive. Let us all rise and sing "Onward Christian Soldiers."

* * *

Champ!

AFTER many long hours of harranguing and debating over the sheaf of replies received in our recent signature-interpreting contest, the august judges, weary and worn, announce the $5 prize winner: Fred G. Brindley, Bliss & Laughlin Inc., Harvey, Ill. Congratulations, Fred, but don't go out now on a terrific spending spree and wind up in jail, as so many other contest winners have done.

Fred's entry, in case you are interested, was done up in handsome form, with beautiful script letters colored red and blue. It read:

STEEL *Has Really Developed Leadership Unquestioned.*

—SHRDLU

Transportation

Track Material Prices, Page 65

Carnegie Steel Co. last week rolled about 2500 tons of rails against recent small orders, including 1200 tons from the Nickel Plate, 900 tons from the Pittsburgh & Lake Erie, and a small lot of export rails. The orders from the Nickel Plate and Pittsburgh & Lake Erie are for delivery through August and September, but rollings were grouped.

A proportionately large number of inquiries for car materials and finished rolling stock from South American countries, Mexico and the Far East are being circulated in American markets. National Railways of Mexico expect to buy a number of tank cars and as well to build 200 standard gage box cars at its Mexico City shops. It is reported that trucks for the 200 box cars will be bought from the American Pullman Car Co., and that orders will be announced soon on 85 standard gage tank cars.

It is believed that the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., will share principally in the steel required for the 500 all-steel box cars to be built by the Pullman-Standard Car Mfg. Co. at Richmond, Va., as it is understood Southern mills will be favored.

The Virginian Railways have distributed car parts, involving 1000 tons of steel. Virginia Bridge & Iron Works, Roanoke, Va., is reported to have received approximately one-third of this work.

Rail Orders Placed

Pittsburgh & Lake Erie, 900 tons, to Carnegie Steel Co., Pittsburgh, for shipment through August and September.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh — Cold-finished steel bars remain firm at 1.95c, base, Pittsburgh, with no early change in view. Advance buying for 1936 automobile models by screw machine product makers has been a feature and the agricultural implement trade is also a prominent buying source.

Sheets

Sheet Prices, Page 64

Pittsburgh—Sheet mills have booked a heavy volume of automotive orders which buyers estimate will suffice for their needs the remainder of the third quarter. Most of this business has been placed on the books awaiting release and shipping instructions. These releases are not expected to be issued for another ten days to two weeks, but the situation indicates a good September. Led by rural buying, both black and galvanized sheet mill operations are higher at 60-65 per cent and orders are concentrated in standard sizes. Pittsburgh base prices on sheets: No. 20 gage cold-rolled, 2.95c; No. 10 gage cold-rolled, 2.50c; No. 24 gage hot-rolled annealed, 2.40c, and heavy hot rolled, No. 10 gage, 1.85c. The market on galvanized sheets is 3.10c, Pittsburgh.

Cleveland—New commitments direct from automobile manufacturers to sheet producers in this district generally are in lighter volume. A slight increase in production is noted, to offset a slower rate in the preceding two weeks which was due mainly to hot weather. Partsmakers are a little busier. Though demand from makers of household equipment is somewhat slower, it is still showing remarkable volume for this time of the year. Some mills mention the possibility of an advance in base prices for the fourth quarter, to offset the loss occasioned by waiving drawing extras for the automobile industry.

Prices of monel metal have been adjusted, effective Aug. 15, including all types of sheets. For the lighter gages there is a slight advance, and for the heavier gages a 5 to 10 per cent reduction. The new base is 38 cents per pound, f.o.b., Huntington, W. Va. The warehouse base is 41 cents for orders of 150 pounds or more, and 43 cents for orders under 150 pounds, f.o.b. warehouse.

Chicago—Sheet demand is well maintained with some gains noted in automotive orders, though shipments to motor car interests continue near the lowest level for the year. Additional purchases for new models are expected to be made shortly, while a maintenance in sheet consumption by miscellaneous consumers is anticipated. Sheet prices have successfully resisted attempts by consumers to obtain concessions.

Washington—Purchasing officer, Panama Canal, closes Aug. 19 under schedule 3078 on approximately 125 tons of galvanized corrugated roofing sheets, 10,000 pieces, and 1000 piece of galvanized ridge roll.

Boston—For small tanks for the oil burner and oil industries, demand for hot-rolled annealed sheets is active. Container and other industrial consumers are relatively less active than tank builders, but specifications. Jobbers are buying steadily, but not heavily.

New York—Miscellaneous sheet tonnage appears to be holding up well. It is coming from diversified industries and is usually for prompt requirements. With no advance in prospect for this fall—at least that seems to be the opinion at the moment—consumers are making no effort to buy ahead.

Philadelphia—Although sheet tonnage is still spotty, the trend in volume appears upward from last month, when general specifications fell somewhat under those for June. The nine bidders, whose figures were accepted on the 250 tons of license tag stock for the state of Pennsylvania quoted the same price. It now appears probable that the bidders with sheet mills in the state will be asked to draw for the tonnage. Base

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prices are unchanged, with the trade looking for no change in prices for next quarter, which will probably be announced 10 days before the close of this month, in accordance with the custom established when the steel code was in operation.

Cincinnati — Sheet demand during the past two weeks has shown an upward trend, due chiefly to automotive needs. Rolling schedules are slightly better than 60 per cent. Specifications for household equipment are steady and buying of galvanized is at a rate to prevent accumulation of normal mill stocks. Prices are firm.

St. Louis—Sheet demand is holding up well, with miscellaneous requirements accounting for the major part of the tonnage. The leading producer reports some improvement in inquiry for heavier gages from the oil industry, notably in the Southwest. Galvanized sheets are moving in fair volume, shipments in July being considerably larger than the total of either May or June. Stove manufacturers and the household appliance industry still are heavy buyers, less than the usual seasonal slackening in activities being noted in these classifications.

Birmingham, Ala.—The sheet mills of Fairfield and Gadsden, Ala., are on a fairly good schedule. These mills have had a lengthy run, and the material is being shipped about as steadily as manufactured.

Pipe

Pipe Prices, Page 65

Pittsburgh—A. M. Byers Co., producer of wrought iron products since 1864, last week announced it would begin the manufacture immediately of steel pipe to supplement its present line, including pipe, plates, sheets, merchant bars, etc. The company stated, "Our customers who buy steel pipe as well as wrought iron have suggested that we make steel pipe, thereby meeting practically all of their pipe requirements." For the time being production of the Byers steel pipe will be concentrated at the South Side works, Pittsburgh. The Byers company is offering butt and lap weld pipe from ⅛ to 14-inch diameter.

The steel pipe market is devoid of tonnage orders at present but mechanical tubing, oil country goods and standard pipe, to an extent, are leading the market. No line pipe developments have been reported recently. Discounts are firm on all grades and classifications of pipe.

Cleveland—Small orders for cast pipe from Ohio towns are developing more frequently, Fayette, Pemberville, Walbridge and Ottawa placing a total of 750 tons. Miscellaneous orders for steel pipe, principally from warehouse, are holding up well.

Chicago—Backlogs of cast iron pipe producers are declining as a result of continued quietness in new business. A few inquiries are appearing but these invariably take small lots, with a similar situation prevailing in orders. Delay in completing federal loans for proposed municipal work continues an important factor in retarding business, and prospects for any marked improvement during the next several months are regarded as poor. Utilities are making but few purchases, while demand from industrial plants also is light. Pipe prices remain firm.

Boston—Merchant steel pipe demand is featured by requirements for a housing project near Eastport, Me., several hundred permanent and temporary residences to be erected in connection with the tidal power project at Passamaquoddy bay. Demand with resellers is steady. Cast pipe buying is light. A. M. Byers Co., Pittsburgh, will furnish wrought pipe for the heating and plumbing, parcel post building, Boston.

New York—Award of close to 2000 tons through a contractor for East Orange, N. J., features cast pipe buying, volume for the most part being confined to small fill-in lots on which prices are holding fairly well. Goshen, N. Y., is planning a water line extension on which bids are expected in the near future. A long deferred award for Buffalo for 36-inch material went steel, bids having been taken on several alternates, including cast iron.

Resale pipe market in the metropolitan area continues increasingly unsettled. Even under the steel code the situation here was unsatisfactory and since termination of the code the resale market has become decidedly more unstable.

Philadelphia—Rush specifications for tubing are being received here, with district operations virtually at capacity.

Birmingham, Ala.—While few awards are being reported, cast iron pipe shops are operating at about 40 per cent of capacity. United States Pipe & Foundry Co. has contract for 325 tons for Del Rio, Tex., waterworks system, and is furnishing 1000 tons to Guthrie, Okla.

San Francisco—Bids will be opened Aug. 16 by San Francisco for the largest tonnage of the year, 1995 tons of 6 and 8-inch, class 150 pipe. Awards currently are confined to lots of less than 100 tons. Demand, generally, reflects the usual summer lull

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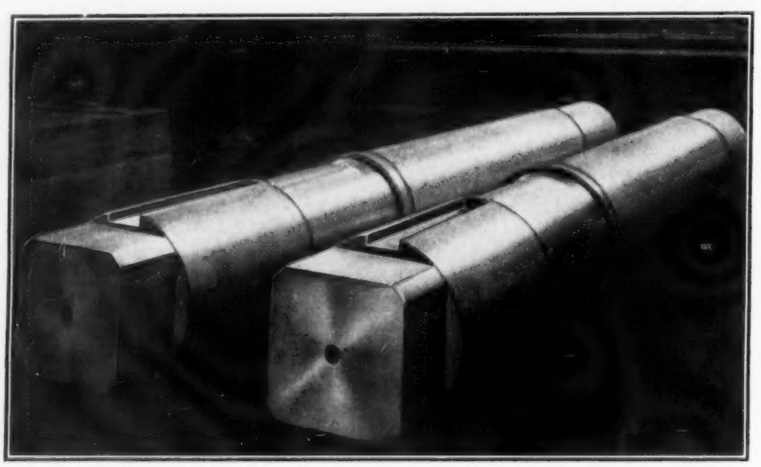

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and the outlook for the next few weeks is not encouraging. Movement of standard steel pipe pipe continues brisk. No award has yet been made on over 2000 tons of 60-inch cast iron pipe for an outfall sewer in Los Angeles.

Seattle—The market has developed no increased activity but important projects are to be up for figures as quickly as official red tape is unwound. For immediate action no important specifications are out. Great Falls, Mont., has received bids for a car of 4, 6 and 8-inch cast pipe.

Cast Pipe Placed

1950 tons, 24-inch, East Orange, N. J., to United States Pipe & Foundry Co., Burlington, N. J., through contractor.

300 tons, Fayette, O., to James B. Clow & Sons, Chicago.

320 tons, Pemberville, O., to James B. Clow & Sons, Chicago.

125 tons, 8 and 12-inch, Fifty-sixth avenue improvement, Seattle, to United States Pipe & Foundry Co., Burlington, N. J., through Hugh G. Purcell, Seattle.

100 tons, Walbridge, O., to James B. Clow & Sons, Chicago.

100 tons, estimated, 8 and 10-inch, New London, Conn., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

200 tons, 6, 8 and 30-inch, class 150 and class B, Portland, Oreg.; bids in.

1995 tons, 6 and 8-inch, class 150, San Francisco; bids Aug. 16.

Shapes

Structural Shape Prices, Page 64

New York—Structural steel buying is sluggish with few pending projects active requiring more than 1000 tons, three of which are the Bronx post-office, 2000 tons, a jail in that borough and a depressed highway for the Triboro bridge, 1400 tons, Woodcrest Construction Co., being low on the general contract for the latter. Awards include 1200 tons for a plant addition, Washburn Wire Co., Manhattan.

The first subway construction contract in several years is due out in September, when the board of transportation will open bids for the first section of the Sixth avenue subway, Fortieth to Forty-fifth streets, taking about 3300 tons of shapes.

Fabricating shops reporting to the American Institute of Steel Construction operated at 38.3 per cent during June. This estimate was based upon reports received from plants owning 78 per cent of the capacity of the whole industry.

June bookings were approximately 60 per cent larger than the average, monthly, for the first five months of this year, but they just about equaled the bookings for the same month in 1934. June shipments were approximately 14 per cent less than the shipments during June, 1934, but approximately 7 per cent larger than the average, monthly, during the first five months of this year. The backlog of the industry is approximately 34 per cent less than last year.

Pittsburgh — Engineers have definitely awarded 2500 tons of structural shapes in 11 railroad bridges in the Muskingum, O., district to Mt. Vernon Bridge Co., Mt. Vernon, O., this award superseding a former

Shape Awards Compared

	Tons
Week ended Aug. 10	21,260
Week ended Aug. 3	14,400
Week ended July 27	5,173
This week, 1934	23,882
Weekly average, 1934	16,284
Weekly average, 1935	14,481
Weekly average, July	15,240
Total to date, 1934	578,169
Total to date, 1935	483,887

ATLAS GAS-ELECTRIC LOCOMOTIVES

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impression that Fort Pitt Bridge Works, Pittsburgh, low on two of the 11 jobs, would receive about 250 tons. Structural inquiries are more numerous for small-size jobs, but projects of over 100 tons in size individually are fewer in number. Bidders are preparing estimates on the Baltimore & Ohio railroad bridges at Grafton and Phillipi, W. Va., to be bid Aug. 19, to the Pittsburgh engineers.

Cleveland—The market is stronger and some fairly good tonnages are pending. Republic Structural Iron Works, Cleveland, is low bidder for fabricating 600 tons for the administration and service buildings at Cleveland's easterly sewage disposal plant. Elyria, O., will take bids this week on a 1,000,000-gallon elevated water tank, requiring 500 tons of shapes and plates. Pittsburgh & Lake Erie railroad is taking bids on 500 tons of beam spans and miscellaneous structural items.

Chicago — Structural awards of 8000 tons are the heaviest in a number of weeks. While more than half of this total is accounted for by piling and shapes for Mississippi river locks at New Boston, Ill., and Red Wing, Minn., about 1000 tons is for plant construction for the Fisher Body and International Harvester companies. Specifications for plain material have been heavier lately but new inquiries are small.

Boston—New structural contracts in New England total about 500 tons. First contracts for the tidal power project at Passamaquoddy bay, Eastport, Me., are out for bids, including several hundred houses and foundation exploration, but little structural steel is involved. Estimates of steel needs for this project are uncertain, but close to 50,000 tons, reinforcing bars, steel piling and structurals now appears to be probable. Little, if any tonnage, is likely to come out this year on the main project.

Birmingham, Ala. — Structural steel fabricating shops are active. Virginia Bridge & Iron Co. will fabricate two 210-foot spans for the Cotton Belt railroad over the Arkansas river, requiring 600 tons of steel.

Philadelphia — Structural awards recently have been negligible, although three or four fair-size jobs are pending in this district, and in Washington at least two large projects previously noted are still pending. These latter are the department of interior building and the addition to the Archives building. Irwin & Leighton, Philadelphia, were low on the Wilmington, Del., post office, involving 1080 tons of shapes, and 120 tons of bars. Bids on the Atlantic City, N. J., post office, involving 800 tons of shapes and approximately 120 tons of bars, will go in Aug. 9. Shapes are steady at 1.90c, Bethlehem, Pa., or 2.01½c, Philadelphia.

San Francisco — Structural steel shape awards in the Pacific coast district aggregated 3705 tons. So far this year 57,305 tons have been placed, compared with 84,923 tons for the corresponding period in 1934. Bids have just been opened by the Pacific Telephone & Telegraph Co., San Francisco, for a new building, requiring 550 tons. Pending business now exceeds 30,000 tons.

Seattle—Awards for the Bonneville, Oreg., dam featured the market. For the spillway, and miscellaneous items, the Columbia Steel Co. will fabricate 6160 tons. Lock operating equipment, totaling 1790 tons, went to the Pacific Coast Steel Corp., while 700 tons for intake gates and stop logs went to Worden-Allen Co., Milwaukee. About 700 tons still are pending for gantry cranes at Bonneville.

Shape Contracts Placed

6160 tons, spillway and miscellaneous items, Bonneville, Oreg., dam, to Columbia Steel Co., San Francisco.

2500 tons, 11 railroad bridges, relocation of tracks, Muskingum, O., conservancy district development, to Mt. Vernon Bridge Co., Mt. Vernon, O. This contract was previously reported as 2000 tons in total, 1750 tons to Mt. Vernon Bridge Co. and 250 tones to Fort Pitt Bridge Works, Pitsburgh.

2420 tons, lock No. 17, New Boston, Ill.; 1500 tons of piling to Bethlehem Steel Co., Bethlehem, Pa., 920 tons of shapes to Independent Bridge Co., Pittsburgh. Massman Construction Co., Kansas City, Mo., general contractor.

2200 tons, lock No. 3, Red Wing, Minn.; 1300 tons of piling to unstated interest, 900 tons of shapes to Independent Bridge Co., Pittsburgh. Spencer, White & Prentis, New York, general contractor.

1790 tons, lock operating equipment, Bonneville, Oreg., dam, to Pacific Coast Steel Corp., Seattle.

1200 tons, plant addition, Washburn Wire Co., East 118th street and Harlem river, New York, to McClintic-Marshall Corp., Bethelhem, Pa.; John H. Deeves & Bro., New York, general contractor.

1100 tons, bridge, Columbus, Nebr., to Worden-Allen Co., Milwaukee.

700 tons, intake gates, stop logs, etc., Bonneville, Oreg., dam, to Worden-Allen Co., Milwaukee.

700 tons, plant, Leeds, Mo., for Fisher Body Co., to Kansas City Structural Steel Co., Kansas City, Mo.

600 tons, plant addition, for Chrysler Corp., Detroit, to McClintic-Marshall Corp., Bethlehem, Pa.

485 tons, Broadway tunnel, Oakland, Calif., to Berkeley Steel Construction Co., Berkeley, Calif.

390 tons, miscellaneous material for distributor station, San Francisco-Oakland bay bridge, to American Bridge Co., Pittsburgh.

340 tons, sound stage, Fox Film Corp.,

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Hollywood, Calif., to Consolidated Steel Corp., Los Angeles.

325 tons, bridge, Ft. Wayne, Ind., to McClintic-Marshall Corp., Bethlehem, Pa.

270 tons, main building, high school, Anaheim, Calif., to Minneapolis-Moline Power & Implement Co., Minneapolis.

260 tons, Salmon river bridge, Idaho, to unnamed interests; Interstate Construction & Engineering Co., Newport, Wash., general contractor.

250 tons, miscellaneous steel, specifications 691-D and 699-D, Boulder dam powerhouse, Nevada, to unnamed interest.

205 tons, building, 111 Park avenue, New York, to Wetherly Steel Co., New York.

200 tons, bridge, Osborn, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

180 tons, tunnel ribs, bid 41,285, metropolitan water district, Los Angeles, to Commercial Shearing & Stamping Co., Youngstown, O.

170 tons, extensions to five small buildings, Butler, Pa., works of American Rolling Mill Co., to Jones & Laughlin Steel Corp., Pittsburgh.

150 tons, Murray-Wolbach building, Chicago, to Wendnagel & Co., Chicago.

150 tons, plant building No. 31, International Harvester Co., Chicago, to Vierling Steel Works, Chicago.

150 tons, garage, Boston elevated railway, Charlestown district, Boston, to New England Structural Co., Everett, Mass.

140 tons, power plant, McCormick works, International Harvester Co., Chicago, to Gage Structural Steel Co., Chicago.

130 tons, dormitory, Middlebury college, Middlebury, Vt., to Bethlehem Contracting Co., Bethlehem, Pa., through Hegeman, Harris Co., New York.

125 tons, repair material, Illinois Central railroad, bridge W182-03, Dubuque, Ia., to Gage Structural Steel Co., Chicago.

120 tons, service station, Pittsburgh, for Gulf Refining Co., Pittsburgh, to American Bridge Co., ittsburgh.

120 tons, building, Queens County Savings bank, Flushing, N. Y., to Nassau Iron Works, New York, with Joseph T. Ryerson & Son Inc., New York, to fabricate; through C. T. Wills Inc.

120 tons, state bridge, Brownsville, Me., to Berlin Construction Co., Berlin, Conn.

115 tons, addition and alterations, H. M. Browne school, Washington, to Dietrich Bros., Baltimore.

115 tons, addition to prison, San Quentin, Calif., to Herrick Iron Works, Oakland, Calif.

Shape Contracts Pending

3300 tons, first section, Sixth avenue subway from Fortieth to Forty-fifth streets, New York; bids in September.

3370 tons, standard deep arch steel sheet piling, water front improvements, Miami, Fa., Jones & Laughlin Steel Corp., Carnegie Steel Co., Inland Steel Co., and Kalman Steel Corp., all bid $202,960, Aug. 1. On 230 tons of used standard piling, all bidders quoted $12,673. Virginia Bridge & Iron Co., Birmingham, Ala., low on channels, angles and plates, and Pittsburgh Screw & Bolt Co. on rods and bolts approximately a total of 225 tons.

3200 tons, including 1400 tons of piling, dam No. 7, LaCrosse, Wis.; Warner Construction Co., Chicago, low for general contract. McClintic-Marshall Corp., Bethlehem, Pa., low for fabricated steel.

2000 tons, postoffice, Bronx, N. Y.; bids Aug. 20.

1400 tons, depressed highway, Astoria boulevard, between Twenty-ninth and Seventieth streets, Queens connection, Triboro bridge, New York, Woodcrest Construction o., New York, low on general contract, $1,579,099, bids Aug. 9.

1080 tons, postoffice, Wilmington, Del., Irwin & Leighton, Philadelphia, low on general contract; approximately 120 tons of bars also required.

700 tons, transmission towers, Boulder City, Mo.

620 tons, lock No. 14, Le Clair, Iowa; Central Engineering Co., Davenport, Iowa, low for general contract. Independent Bridge Co., Pittsburgh, low for fabricated steel.

600 tons, administration and service buildings, easterly sewage disposal plant, Cleveland; Hunkin-Conkey Construction Co., Cleveland, low for general contract; Republic Structural Iron Works, Cleveland, low for shape fabrication.

550 tons, telephone building, San Francisco; bids opened.

400 tons, postoffice, San Pedro, Calif.; bids opened.

375 tons, state bridges, Michigan.

360 tons, piling, seawall, Sausalito, Calif.; A. W. Kitchen, San Francisco, low on general contract.

325 tons, bridge, Central Railroad of New Jersey, Raritan N. J.; Phoenix Bridge Co., Phoenixville, Pa., low on direct bids, for immediate fabrication and delivery.

300 tons, two bridges between buildings for department of agriculture building, Washington.

200 tons, state bridges, highway commission, Columbus, O.; bids Aug. 5, 13 and 20.

200 tons, state bridge, Atlantic county, New Jersey, Eastern Engineering Co., Atlantic City, N. J., low on general contract. It is reported the bid exceeded appropriation, so the project may come up for new figures.

190 tons, pump house, Columbus, O.

175 tons, school, Louisville, Ky.

150 tons, mail and service building, New York Central railroad, Syracuse, N. Y.

125 tons, shapes and bars, postoffice, Far Rockaway, N. Y., Silberblatt & Lasker Inc., New York, low.

110 tons, bridges and grade crossings, Arkansas; bids Aug. 14, state highway department, Litte Rock.

100 tons, shapes and bars, postal station "B," New York, Globe Building Corp., New York, low.

Quicksilver

New York—Aug. 9.—Quicksilver prices continue easy this week in a quiet market. Round lots of 100 virgin flasks are $69.50 a flask, down 50 cents from a week ago, with the possibility that lower levels might be

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done. Small lots of 15 to 24 flasks, inclusive, are $71.

Reinforcing

Reinforcing Bar Prices, Page 65

New York—Bids on two general contracts for projects taking 3200 tons are in, grade crossings at Staten Island, and a depressed highway connecting with the Triboro bridge, taking 1500 and 1700 tons, respectively. These, with other active projects in the district total close to 5000 tons, including a sewer project bridges and highways. Awards are light.

Most sellers report an encouraging gain in small lots. New York state closes bids Sept. 4 on a large tonnage of highway mesh and bars.

Chicago—Bar awards are aided by the placing of 1350 tons for Mississippi river locks at New Boston, Ill., and Red Wing, Minn. Lock and dam work still predominates pending business, with 1075 tons involved in two units on which bids recently were opened. Private work is lagging, particularly in projects involving more than 100 tons. A sewage disposal plant at Chicago Heights, Ill., will take 350 tons with 165 tons pending for a filter plant at Des Plaines, Ill.

Pittsburgh—Projects requiring 10 to 30 tons each are more numerous. Mill bookings have declined so far in August as against July, but distributors report a fair volume of inquiry. The mill price on new billet steel for reinforcing purposes is 2.05c, carload lots, with observance of the usual allowance to distributors. For shipment out of local warehouse, plain reinforcing bars are 3.05c and twisted squares, 3.175c.

Cleveland—Since reinforcing bar fabricators reduced bending extras there is considerable negotiating on the substantial tonnages still pending for the Muskingum, Ohio, conservation district, and for several buildings at Cleveland's easterly sewage disposal plant. Small orders for material are fairly numerous. Elwell-Parker Electric Co., Cleveland, is taking bids on a new factory building requiring 125 tons.

Philadelphia—Featuring new bar inquiry is 750 tons for the Neversink reservoir, Reading, Pa., on which general contractors bids go in Aug. 21. Several other fair size tonnages are pending in this district and in Washington. Actual buying continues light. The state of Pennsylvania has finally entered the market for two road jobs, but the steel requirements are small. Reinforcing bar sellers continue perplexed over the outlook on grade crossing elimination work, with the general feeling that little of this work will develop in the near future. The base price on billet steel bars, cut lengths, is 2.05c, Pittsburgh, or 2.36c, Philadelphia.

San Francisco—Awards of reinforcing bars were the largest in over a month and aggregated 1854 tons, bringing the total for the year to 74,549 tons, compared with 69,050 tons for the same period a year ago. Included were 757 tons for the Pickens channel conduit, Los Angeles county, and 479 tons for the Del Valle avenue conduit, for the same county. Present pending business is the largest in the history of the Pacific coast and exceeds 120,000 tons, most of which will be placed, it is thought, within the next 30 days.

Seattle—Public projects are requiring heavier tonnages than private work. Of approximately 3500 tons pending, 2400 tons are needed for two government dams in Wyoming. In Washington and Oregon little business is in sight, highway contracts involving only small lots.

Concrete Awards Compared

	Tons
Week ended Aug. 10	2,689
Week ended Aug. 3	2,502
Week ended July 27	1,410
This week in 1934	2,758
Weekly average, 1934	4,084
Weekly average, 1935	4,227
Weekly average, July	2,225
Total to date, 1934	146,433
Total to date, 1935	139,507

Reinforcing Steel Awards

757 tons, Pickens channel conduit for Los Angeles county, California, to J. W. Black Co., Long Beach, Calif.

753 tons, lock No. 3, Red Wing, Minn., to Paper, Calmenson & Co., St. Paul; Spencer, White & Prentis, New York, general contractor.

600 tons, lock No. 17, New Boston, Ill., to Kalman Steel Corp., Bethlehem, Pa.

479 tons, del Valle avenue conduit for Los Angeles county, California, to Security Materials Co., Los Angeles.

100 tons, weir, Hanford, Calif., to unnamed interest.

Reinforcing Steel Pending

2425 tons, Monrovia and San Rafael tunnels for metropolitan water district, Los Angeles, general contract for placing only to L. E. Dixon, Bent Bros., and Johnson Inc., Los Angeles.

1700 tons, depressed highway, Astoria boulevard, between Twenty-ninth and Seventieth streets, Queens connection, Triboro bridge, New York; Woodcrest Construction Co., New York, low on general contract, $1,579,099, bids

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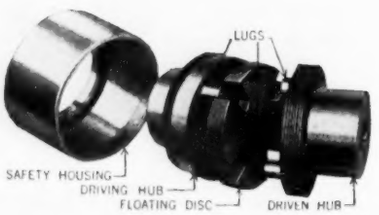

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1500 tons, grade crossings, Staten Island Rapid Transit Co., Elm Park and Mariners Harbor, Staten Island, N. Y. McElroy & Kerwin, New York, low, $631,048.67; Foley Bros., New York, second, $664,039.25.

600 tons, lock No. 14, Le Clair, Iowa; Central Engineering Co., Davenport, Iowa, low for general contract.

500 tons, grade crossings and bridges, Aabama; bids Aug. 14, state highway department, Montgomery, Aa.

475 tons, dam No. 7, LaCrosse, Wis.; Warner Construction Co., Chicago, low for general contract.

350 tons, sewage disposal plant, Chicago Heights, Ill.

300 tons, administration building and toll plaza, San Francisco-Oakland bridge, San Francisco; general contract to Clinton Construction Co., San Francisco.

250 tons, first section, Sixth avenue subway from Fortieth to Forty-fifth streets, New York; bids in September.

250 tons, government soil conservation service, La Crosse, Wis.; bids in Aug. 5.

185 tons, Fifth street bridge, Parkersburg, W. Va.; bids July 9.

165 tons, filter plant, Des Plaines, Ill.; B-W Construction Co., Chicago, low for general contract.

150 tons, Neversink reservoir, Reading, Pa.; bids Aug. 21.

125 tons, factory, Elwell-Parker Electric Co., Cleveland.

120 tons, postoffice, Wilmington, Del., Irwin & Leighton, Philadelphia, low on general contract; approximately 1080 tons of shapes required.

116 tons, state highways, highway commission, Columbus, O., bids Aug. 5, 13 and 20.

Unstated tonnage, warehouse, Loeb & Hene, Lafayette, Ind.; A. E. Kemmer, Lafayette, general contractor.

110 tons, state bridge, Atlantic county, New Jersey, Eastern Engineering Co., Atlantic City, N. J., low on general contract; new bids may be asked as it is understood bid exceeded appropriations.

100 tons, highways and bridges, Arkansas; bids Aug. 14, state highway department, Little Rock, Ark.

100 tons, seawall, Sausalito, Calif.; A. W. Kitchen, San Francisco, low on general contract.

Strip Steel

Strip Prices, Page 65

Pittsburgh—Recent irregularities in drawing extras on full finished sheets have proved a disadvantage to strip sellers under operation of their commodity classification setup. The rate of strip demand continues to show gain, but shipments are for smaller size individually than was true a few months ago. Automobile makers have placed a large quantity of strip business but have not yet issued releases and probably will not for another ten days to two weeks. Strip mill operations are steady at 30-35 per cent of capacity for both hot and cold-rolled grades. Base prices remain firm at 1.85c, Pittsburgh, for hot rolled and 2.60c, Pittsburgh or Cleveland, for cold-rolled.

Cleveland—Strip steel specifications have increased substantially, General Motors units making some important purchases. Orders from cold-rolling mills also have picked up. Prices are steady.

Chicago—Strip buying is steady at about the rate of a month ago, but an improvement is looked for later this month in connection with the expected increase in automotive requirements. Business from miscellaneous consumers still is marked by diversification and the manner in which such business has been maintained during what is normally a dull period. Producers are adhering to usual market prices.

Boston—Improvement in cold strip demand is irregular, miscellaneous outlets furnishing the most activity. Operations with some producers have increased a few points, but backlogs are small as a rule, with consumers buying close to requirements. Hot strip is less active than 10 days ago when some rerollers covered sparingly. Prices are firm and unchanged.

New York—Cold rolled strip demand has shown steady increase for several weeks and is largely miscellaneous. Fourth quarter prices are expected to be unchanged.

Philadelphia—Little variation is noted in strip demand, which continues light. Prices are unchanged, with hot strip at 1.85c, Pittsburgh, or 2.16c, Philadelphia, and cold strip at 2.60c, Pittsburgh, or 2.91c, Philadelphia.

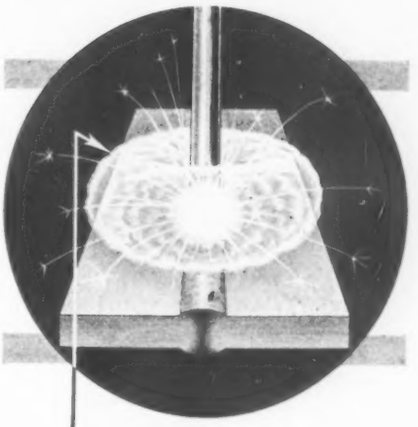
Wire

Wire Prices, Page 65

Pittsburgh — Wire product buying, mainly in manufacturing and spring wire, has improved to a point where mill bookings so far in August, for prompt shipment, have reached a point bettering the early July showing. Several large orders for manufacturing wire have been placed by Detroit interests in specifications covering revisions for 1936 automobile models. The rural trade is still a heavy buyer of fencing and barbed wire items, a reflection of good crop conditions. The Pittsburgh base of 2.30c on plain manufacturing wire, $2.60 per keg on nails, and 2.90c on spring wire is firm.

Cleveland—Demand for manufacturers' wire is slightly heavier than in July, while shipments of wire and fencing to agricultural areas have declined. Larger size orders for nails are noted.

Chicago — Steel wire demand is steady at about the rate prevailing



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a month ago. Sales and shipments are bettering expectations. Automotive orders usually are for material to complete present models, with only small lots placed so far for the new models on which production is to start shortly. The diversification in demand for manufacturers' wire continues a leading feature in steady business for this commodity. Wire prices are steady despite some pressure from manufacturers' wire consumers.

Boston—Buying of wire specialties has improved and demand for manufacturers' wire is steady, with a somewhat better call for other wire mill products, heavier goods still lagging. Merchants' wire is slightly more active, with some mills and jobbers taking shipments in larger tonnages, although few consumers are purchasing far in advance, asking quick delivery and specifying frequently. Steel wire rod imports in the Boston customs district in July totaled 213 tons, mostly from Sweden.

New York—An unsettled resale situation throughout the country with respect to wire nails is attracting earnest consideration of producers but no satisfactory plan has been proposed.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Demand for bolts and nuts is slow with some irregularity in prices, concessions from 70-10-5 off list being allowed in some cases. Rivets are steady at 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago.

Chicago suppliers find demand from railroad car shops is light and jobber specifications have been light recently on account of price shading.

At Cleveland releases from automobile manufacturers have slowed up, although there are indications that they will be increased shortly as the industry gets started on its new model assemblies. The volume of incoming business from implement manufacturers also has diminished slightly. Railroad buying remains light. Consumers generally are signing up contracts for fourth quarter.

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh — Carload orders for pig iron are more numerous in this district although buying does not exceed proportion of a small purchase last week by Standard Sanitary Mfg. Co. for its Woods Run, Pittsburgh, plant—about 100 tons of foundry iron to a 1.75 silicon, 0.40 phosphorus and 1.60 per cent manganese content, placed with a Pittsburgh district furnace. A large part of the current pig iron melt here continues to be on ore conversion contracts for several of the non-integrated steel producers here. Announcement last week that A. M. Byers Co. is entering the steel pipe field has created some speculation that at a later date open-hearth capacity may be installed by the company. The market is firm at $18, Pittsburgh district furnace, for basic, $18.50 for foundry, and $19 on bessemer pig iron. No announcement affecting fourth quarter prices is expected much before Sept. 15. Shenango Furnace Co.'s Sharpsville, Pa., furnace, banked for three months, may resume soon.

Cleveland—Increasing activity is noted in the market. Lake merchant blast furnace interests expect to ship about 15 per cent more in August than in July. Releases from automobile foundries again are picking up, and these with orders from agricultural implement manufacturers form the backbone of current demand. Next in size is the tonnage moving to makers of heating and air-conditioning equipment. Consumers have practically no pig iron inventories, and recent rises in scrap prices has led to the use of more pig iron in mixtures. A merchant furnace interest booked 6000 tons in the week. Prices are firm.

Chicago — Pig iron shipments so far this month are slightly heavier than during the corresponding July period. July was decidedly better than had been anticipated and the outlook for a continuation of the rise in shipments which started last month is seen as favorable. Producers of automotive castings in some instances have started work on parts for new models, and pig iron consumption by this group is expected to gain steadily. Farm implement manufacturers maintain a steady melt. Business for this industry this year is expected to be at least 75 per cent of the average for the years 1928 to 1930. The fact that tractor sales are nearly 60 per cent of the total business against a normal average of 35 to 40 per cent, has raised pig iron consumption by the industry almost to a normal tonnage, since the tractor group takes relatively the largest volume of castings.

Foundries still refrain from ordering far ahead, though sellers are accepting business for shipment only through September. The market is firm at $18.50, furnace, for No. 2 foundry and malleable.

Boston—Pig iron sales are slightly heavier, with individual shipments inclined to be slightly larger. Sellers in this district have all shared in the improvement at unchanged and firm prices for domestic and India grades. Foreign iron continues to move 50 cents to more than $1 under. More foundries have increased melt moderately, although the aggregate rate is still low. Imports of pig iron in July were 432 tons, 25 tons from Norway and the remainder from British India.

New York — Pig iron buying over the past week appeared less active. The furnace of the Chateaugay Ore & Iron Co. is still operating, with no definite date fixed for the suspension of operations, although such action

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is being considered. This stack was closed down for relining last December and resumed production again in the latter part of February.

Foreign competition continues to impose a burden on Eastern producers, with imported iron prices easier and with volume practically sustained. Arrivals during the first half amounted to approximately 53,500 tons. This is at the annual rate of 107,000 tons, as against 115,000 for last year. Incidentally, the heaviest arrivals of foreign pig iron so far this year were in May when 23,724 tons was received.

Philadelphia—Although still confined to small orders, pig iron business continues to expand. Competition from foreign sellers is increasingly severe, but domestic prices are holding.

Buffalo—Demand for pig iron is holding up surprisingly well throughout the midsummer period. Small transactions are the rule, but the volume is considerable.

Cincinnati—Shipments of pig iron so far in August have been heavier than for a similar period in July. The trend indicates a heavier melt, as melters without exception are not laying down inventory. Fresh purchases are confined to small lots but it is likely some supplementary buying will develop in a few weeks. Prices are steady.

St. Louis—Despite extremely hot weather, activity in pig iron is well sustained, both in shipments and new purchasing. As has been the case for the past several weeks, bulk of tonnage moving is toward plants of specialty makers. Machinery manufacturers report no let-down in demand for their products, with implement concerns enjoying the best business in years. One distributor of southern iron reports advance orders as of Aug. 1 to be 400 per cent greater than on the same date last year. Indications point to total August shipments of about a volume equal to July.

Birmingham, Ala.—Five blast furnaces are in operation, four on foundry and one on basic, with little iron going to the surplus stock. There has been some reduction of the tonnage of iron on yards. Melters are still buying in limited quantities but express confidence there will be warrant for purchasing more frequently shortly. Seven or eight blast furnaces are in such shape as to be called into service on short notice.

Toronto, Ont.—It is understood contracts for rolling stock in connection with a $15,000,000 program, will be awarded by Canadian railroads within the next week or two, and this business will have a stimulating effect on iron sales early in the last quarter. Current production is holding with prices unchanged.

Scrap

Scrap Prices, Page 68

Pittsburgh—The market lost some of its strength last week through shipping holdup instructions by several district mills and the fact that no fresh consumer buying was reported. Quick to capitalize the turn, brokers in most cases dropped their buying prices to around a $12.50 to $12.75 level on No. 1 heavy melting steel. The lukewarm buying attitude of a down river consumer has done more than anything in this district to take the edge off the market recently.

Cleveland—Interest in iron and steel scrap continues to drag owing to the absence of important steel buyers. Shipments here include lighter materials for most part, with a sprinkling of heavy melting and pressed sheet grades in small lots, and some heavy cast. This lack of interest has led to lowering of the Cleveland price on heavy melting steel by 50 cents a ton.

Chicago—Heavy melting steel has advanced another 50 cents on consumer buying at $12.50. This is a new high for the current movement and an increase of $2.25 for the past four weeks. Prices of other grades also are higher, with factory compressed sheets at $11 to $11.50. Heavy melting steel continues the most active item, most mills having been in the market recently, and dealers and brokers are busy picking up this grade. Supplies from distant points are more plentiful as a result of the higher prices, but offerings of certain grades continue scarce. Railroad lists were heavier the past week, with a top price of $12.88, delivered, reported paid for heavy melting steel.

Philadelphia—Although buying is light, No. 1 heavy melting steel scrap has advanced to a flat price of $11, delivered district consuming point, and No. 2 to $10 to $10.50. Little No. 1 steel has been purchased since the Claymont, Del., consumer closed on approximately 10,000 tons about a fortnight ago. Some No. 2 steel is reported purchased for Coatesville, Pa. Mixed yard cast scrap has been advanced to $9.50 to $10, delivered, and No. 1 steel for export was recently boosted 50 cents a ton to $10, wharf. However, this latter price is bringing out little tonnage and the opinion prevails in many quarters that the export market here will dry up, in view of the advancing domestic prices.

Boston—General advances on the

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more active grades of scrap, notably heavy melting steel, have followed a broader demand, especially for domestic consumption, with activity holding against contracts for export. For heavy melting steel, steel works in New England offer $9, delivered, for No. 1 and $8 for No. 2, while skeleton has also advanced. For Pittsburgh $13 to $13.50 is reported bid for heavy melting steel. Machine turnings for that district are also stronger. Export buyers lifted heavy melting prices to $9 to $7.75, dock. Other grades for New England delivery, including heavy breakable and textile machinery cast, are slightly stronger. Sentiment has improved and the tone of the market is more cheerful in view of heavier operations at steel works and some gains in foundry melt.

New York—Shipments of No. 2 heavy melting steel to Eastern Pennsylvania are heavier from New Jersey with dealers paying $7.60, f.o.b., and slightly more. This is higher than the dock price for export at New York, prices for boat loading being unchanged at $8.50 and $7.50, dock, for heavy melting grades. Shipments continue to the Buffalo district, on contracts. Prices are firm, but advances in the immediate New York district are inclined to lag behind other centers. No. 1 railroad wrought is 25 cents higher and $7.50, f.o.b. and better has been paid for cast iron car wheels for Pittsburgh. Barge loads to Bridgeport, Conn., are spasmodic.

Buffalo—The leading scrap consumer has increased its offering price from $10.50 to $11 for heavy melting steel but has found little tonnage in response. Its offer for No. 2 steel is $9.50. Dealers are holding for higher prices confidently expected to develop on the next tonnage inquiry. Recent closing of railroad scrap lists brought higher prices for valley delivery and indicate a strong market.

Detroit—The market maintains a firm undertone but is quotably unchanged except for a 50-cent advance in auto malleable and a 25-cent increase in machine shop turnings. Considerable inroads are being made in scrap production here by the practice of producing mills outside of Detroit in shipping flat rolled steel blanks to Detroit buyers, thus minimizing local scrap production.

Cincinnati—Dealer optimism is sending the buying quotations on scrap iron and steel still higher. Activity among dealers in the advancing market is high, but mills are delaying scrap purchases. Little scrap from a Baltimore & Ohio list, recently sold, came into this district, more attractive bids being entered by upriver interests. Heavy melting steel is up 50 cents, at $9 to $9.50, and other grades likewise advanced.

St. Louis—The deadlock between buyers and sellers of iron and steel scrap has been partly broken because of the need of supplies. The past week or ten days have been marked by a fair volume of sales, mainly of heavy melting steel and steel specialties, exclusively for prompt delivery. Mills are willing to buy substantial tonnages but still are slow to pay prices suggested by dealers.

Birmingham, Ala.—Slow market is still noted and no change is indicated so far as scrap iron and steel is concerned in this section. Heavy melting steel is quoted at $8.50 to $9.50 but little is moving.

San Francisco—Pacific coast melters are well stocked with steel scrap. As a result, the price for foundry scrap is by no means firm, most collectors having large tonnages on hand. No. 1 heavy steel melting scrap is now quoted at $9 a ton. No. 1 cast scrap ranges from $8.50 to $9 a ton, and stove plate $7 a ton.

Seattle—Rise in Pittsburgh prices has firmed the local market and mills are again buying, paying, it is reported, around $7. This activity finds no response in the export situation which is, if possible, weaker than before. Shipping houses state there is no Oriental interest, that China is suffering from the high price of silver and Japan is overstocked with melting steel. At Kobe and Osaka, 33,000 tons are on scows in the harbor under demurrage, while Japanese mills have 200,000 tons on hand, an unusually high stock for that country.

Toronto, Ont.—Demand for iron and steel scrap is dull. Sales have dropped sharply, with orders confined to special grades. Shipments to mills in the Hamilton district have dried up, with the result that there is practically no movement of heavy melting and other steel grades. Only a few small orders were booked for cast and wrought scrap, and stove plate, malleable and other lines were stagnant. Prices are unchanged.

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Warehouse

Warehouse Prices, Page 69

Pittsburgh—Bookings by jobbers the first week in August exceeded the rate for the same time in July. Some buying ran even to carload lots, which is exceptional. Through the advance in mill base sizes on bars, jobbers with present stocks stand to benefit $2 to $3 a ton on popular sizes. All warehouse prices are steady and unchanged.

Cleveland—The volume of warehouse business improved slightly during the week, and tonnage for some interests so far this month is larger than that in the comparable period in July. Orders are well diversified, and prices are firm.

Chicago—Sales approximate those of a month ago. Heavy rolled products show signs of slightly better activity after a long quiet period. Prices are unchanged.

Boston—Warehouse volume is well maintained and the usual midsummer decline has been slight. Improvement with jobbers outside the Boston district is noted. Buying is

well distributed as to products and a steady flow of small orders accounts for most business.

New York — Warehouse volume holds to the rate of recent weeks. Substantial individual orders are few. While prices are fairly steady among larger jobbers, there is some shading, largely in the Brooklyn section, with foreign steel and sheet seconds having an unsettling influence.

Philadelphia — Warehouse business is being well sustained at the restricted volume of the past couple of months. Prices are unchanged.

Detroit—July shipments of warehouse steel exceeded expectations and it was the best month in 1935. A large volume of warehouse steel is going into plant rehabilitation programs. All warehouse prices are steady and unchanged.

Cincinnati—The early August demand for steel from warehouse has pushed the level of sales higher than in July., chiefly for broad industrial needs. Prices are unchanged but revision of some extras, following mill changes, may be announced soon.

St. Louis—The volume of warehouse business in late July and so far this month has been well sustained. Building activities have increased steadily since early spring and accounts for liberal tonnages of a variety of commodities, including standard structural shapes, nails and sheets. As has been true since early summer, demands from the country are unusually heavy.

Seattle—July business held pace with June and August has started briskly. Logging and lumber plants are making replacements but sales are as a rule in small lots. Prices are firm in this area although it is reported that price cutting, started in California, has extended into southern Oregon.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—Tin plate mill operations have declined a few points over the past week and are now at 85 per cent, although a leading interest continues operations close to actual capacity. Favorable crop reports continue to be circulated and should in turn cause further reductions in the heavy existing stocks of finished tin plate in the hands of producers awaiting shipment. There are close to 4,000,000 base boxes of tin plate in mill warehouses. Consequently, it would not be surprising to see a decline before August is over in current in plate operations. The market remains $5.25 per base box, Pittsburgh.

Boston—Tin plate shipments to New England are slightly heavier, due in part to the anticipated demand by cranberry packers, and steady requirements by the few regular consumers in that territory. Failure of the sardine run and consequently no pack in recent seasons has curtailed tin plate demand in the Maine district.

Refractories

Refractories Prices, Page 66

Pittsburgh — With announcement last week that Ford Motor Co. had begun excavation for two new batteries of coke ovens at Dearborn, Mich., details on the refractory brick required were announced by the Ford Motor Co. About 328,000 pounds of silica brick will be used in the construction of each of the 122 new ovens, amounting to 20,000 tons. This brick contract was placed some time ago with an important maker and represents the largest single brick purchase in many years.

Refractory brick prices are steady and unchanged. Super quality fire clay brick is quoted $55 per thousand, Pennsylvania works, first quality, $45, and second quality, $40. Malleable bung brick is $50, silica, $45, and basic chrome brick, $45, the latter two being on a net ton basis.

Semifinished

Semifinished Prices, Page 65

Announcement last week that A. M. Byers Co., Pittsburgh, would enter the steel pipe field will open up a new skelp market for that concern. It is proposed to make the steel pipe at the company's South Side works of skelp to be purchased in the open market.

The nonintegrated tin plate producers have continued to be a strong factor in the semifinished market. Operations of jobbing mills now are up about 5 points to 40-45 per cent of capacity on finishing mill rolling schedules. Both common black and galvanized sheet mills are running at better than 60 per cent currently and also making heavier demand for sheet bars.

The automotive industry has opened up in its purchases of billets, both straight and forging quality, and the same improvement characterizes the miscellaneous buyers. The markets are steady on semifinished steel: sheet bars $28, Pittsburgh; billets, blooms and slabs, $27, and common wire rods, $38. The market on skelp is 1.70c, Pittsburgh, and on tube rounds, 1.80c.

Coke By-Products

Coke By-Product Prices, Page 65

New York—Shipments of distillates against contracts are active with distributors doing practically no spot business. Demand for benzol has resulted in a shortage in most districts. Lacquermakers are taking toluol in substantial shipments, also the chemical industry. Current production of xylol is going directly into consumption. Distillate prices are firm and unchanged. Sulphate of ammonia is more active following the announce-

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ment as to prices, more consumers covering. Phenol and naphthalene prices are unchanged on routine buying, which is not large.

Steel in Europe

Foreign Steel Prices, Page 69

London—(*By Radio*)—British import duties on iron and steel products have been reduced to 20 per cent for a five-month period following the import agreement with the Continental steel cartel. The pig iron market continues active and Scottish iron and steel works have resumed full operation following a holiday period. Export trade generally is dull, but Dorman, Long & Co. Ltd. have booked an order for 3500 tons of rails for China. An important rolling stock contract for China also is reported.

The Continent reports export trade reviving, with British orders resumed and the Near East and Argentine more active. Exports to the Far East are dull.

Ferroalloys

Ferroalloy Prices, Page 66

New York—Continued expansion in ferromanganese specifications is noted, as steel operations become more active. The market is $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, also reflects the improved steelmaking operations, with the market holding at $26, Palmerton, Pa., on quantities up to 50 tons, and $24 on 50 tons. Ferrocolumbium, 50-55 per cent, has been reduced to $2.50 per pound contained, f.o.b. Niagara, N. Y.

Carnegie Steel Co. is preparing to blow in a second blast furnace at Isabella works, Etna, Pa., on ferromanganese. One out of three furnaces there has been making ferromanganese continuously for a number of months.

Metallurgical Coke

Coke Prices, Page 65

Connellsville, Pa., beehive oven coke is in probably the lowest demand of any time this year owing to customers' stocks and the current slack season. The price of standard furnace coke ranges around a $3.25 per ton average at the ovens, and common foundry grades appear to be available at $4 a ton on the same basis. Chateaugay Ore & Iron Co., Lyon Mountain, N. Y., has blown out its Standish furnace, Standish, N. Y., and shut off shipment of Brownsville, Pa., coke recently.

Foundry coke shipments are nearly 35 per cent greater than the rate a month ago as foundries increase their melt. Cincinnati suppliers find the rate of shipment practically unchanged from July, and well above that of a year ago. In the St. Louis district the volume of shipments is well above the usual summer average. Birmingham, Ala., ovens are operating somewhat more lightly as local demand has shown some shrinkage.

Iron Ore

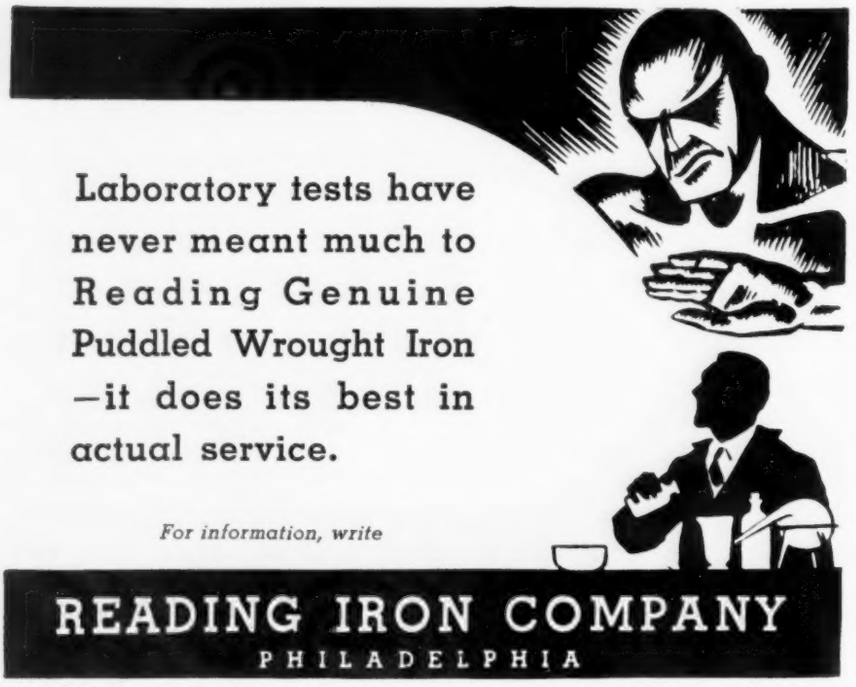
Iron Ore Prices, Page 67

Cleveland—Iron ore stocks at Lake Erie ports are slightly lower than a year ago, according to the Lake Superior Iron Ore association. Receipts at these ports in July totaled 3,295,198 tons, and shipments therefrom to furnaces, 2,328,068 tons. Receipts and shipments for this season to Aug. 1 follow:

Port	Receipts	Shipments	Dock Balance Aug. 1, 1935
Buffalo	816,487	160	2,711
Erie	481,908	495,428	85,974
Conneaut..	1,665,313	1,770,391	1,594,516
Ashtabula	834,394	905,520	1,209,427
Fairport ..	371,428	370,787	387,403
Cleveland..	2,251,027	1,894,665	650,939
Lorain	1,162,752	653,488	12,527
Huron	317,757	309,952	326,817
Toledo	623,099	270,223	11,705
Total	8,524,165	6,670,614	4,282,019
Comparative 1 Year Ago	7,947,330	6,332,537	4,499,858

Receipts for the season at other ports:

Port	Tons
Detroit	489,956
Indiana Harbor	746,300
Gary	733,361
South Chicago	1,311,286
Sault Ste. Marie, Ont.	44,643
Hamilton, Ont.	168,966
Total	3,494,512
Comparative 1 Year Ago	2,924,132
Total Receipts Lower Lake Ports	12,018,677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Nonferrous Metals

Nonferrous Metal Prices, Page 66

New York—The sharp break in tin prices Friday following the announcement that tin export quotas were increased 15 points to 65 per cent of standard tonnages was the outstanding development in the nonferrous metals last week. Copper, lead and zinc maintained a firm market tone.

Copper—Market appears to be headed toward higher prices eventually but no move in that direction is expected in the near future. All first hands were firm at 8.00c, Connecticut, with sales averaging around 1000 tons per day for the week. Prices abroad eased to around 7.85c, c.i.f. at the weekend after 7.97½c was reported paid earlier in the week.

Lead—Demand was not sufficient to lift prices last week as expected. Sales, however, increased after midweek and at least one seller was refusing some inquiries rather than dip

into stocks. This gave the market a very firm tone and prices held at 4.20c, New York.

Zinc—Sales of prime western were limited last week but sellers were content to hold prices firm at 4.50c, East St. Louis. A stronger tone developed toward the end of the week when it was reported that ore prices had advanced $1 per ton.

Tin—International Tin committee increased export quotas of the principal signatory governments from 50 per cent to 65 per cent of standard tonnages. It was considered a constructive move and will likely relieve the tight situation in spot supplies. Immediately following this announcement Friday, Straits spot dropped 47½ points and futures 70 points in the domestic market while quotations on the London Metal exchange sagged heavily. Straits spot closed around 51.62½c compared with the previous week's close of 52.55c. Hope was expressed that the market will find a steadier level this week and that consumer buying will increase.

Antimony—Prices held unchanged on the basis of 13.00c, duty paid, for Chinese spot. Demand was confined to light small lots.

Died:

(*Concluded from Page* 25)

Aug. 6. He also was associated at one time with the Koppers Rheolaveur Co., Pittsburgh, and was a member of the Eastern States Blast Furnace and Coke Oven association.

• • •

Richard Bahmann, 74, former president of the Blymer Iron Works Co., Cincinnati, and the Cincinnati Bell Foundry Co., in that city, Aug. 2. He retired from active business in 1925.

• • •

Oscar J. Shafer, 78, president of O. J. Shafer Pattern Works Inc., which he founded in 1883, in Cincinnati, Aug. 1. He was one of the pioneer members of the Cincinnati branch, National Metal Trades association.

Windows of Washington

(*Concluded from Page* 21)

nominated Charles H. March of Minnesota for reappointment to the federal trade commission. His term expires Sept. 26 and he was nominated for a seven-year term from that date.

Mr. Draper, who has been a member of Secretary Roper's business council for a long time, is a Brain Truster and was named last year on the national labor board.

Equipment

Chicago—Machinery and equipment markets retain recently improved activity in sales and inquiries, with business generally equal to or better than a month ago. The recent trend is in contrast to that of a year ago when business declined steadily during the third quarter. Deliveries of machine tools are being extended, particularly on production and semi-production items, such as automatic screw machines. On commoner maintenance tools, fairly prompt delivery can be offered, but on some other machines as much as 10 to 12 weeks is required for shipments. Machine tool sales and inquiries are steady despite the absence of large lists.

A few miscellaneous orders from steel companies have been placed or are in prospect. Railroad shops, however, continue inactive in equipment buying. Foundry equipment sales are well maintained.

Pittsburgh—Equipment builders

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are awaiting the outcome of bids already submitted on the construction of Carnegie Steel Co.'s modern wide plate mill at the Homestead works, Munhall, Pa. On Aug. 2, United States Steel Corp. finance committee approved the expenditure. Engineering work, carried on for the past several years, has now largely been completed and as soon as contracts are awarded, construction will start. Another prominent prospective piece of steel mill equipment business is the new hot strip and cold reducing mills for Granite City Steel Co. The company, in order to finance this construction, will offer 127,492 shares of common stock on Sept. 3 at an aggregaae maximum price of $2,549,920. Proceeds from the sale of this issue together with $2,000,000 treasury funds will be used to construct the extensions.

Boston—Machine tool orders are steady and some shops, having substantial backlogs, are pushed for delivery. Builders of metalworking machinery are booking fair volume, largely special equipment wtih automatic high-production features. Shops producing paper mill equipment are also booked ahead for several weeks, at capacity operations in some instances. Industrial activity in the Hartford, Conn., district is encouraging. Textile mill equipment plants are lagging behind the general trend. Additional orders have been placed in New England by the navy department, largely grinders and lathes.

New York—A few of the larger machine tool dealers note a slight decline in orders, but most eastern equipment builders report incoming volume holding well to the current improvement with backlogs heavier. Both inquiry and buying covers a broader industrial range. Inquiry for navy yards is slightly heavier. Bids close Sept. 2 with the purchasing officer, Air Depot, Middletown, Pa., on one 3-ton electric bridge crane, one 10-ton electric traveling crane, three 1-ton electric hoists, one 5-ton electric crane, six 10-ton electric hoists, 20 3-ton trolleys and one elevator hoist.

Contracts for motive power control units and other accessories for 500 new subway cars on city-operated lines here, amounting to over $2,000,000, have been awarded to Westinghouse Electric & Mfg. by the board of transportation.

Orders placed by Amtorg Trading Corp. in July totaled $6,000,000, this being the largest volume of purchases in any one month for several years. It compares with $3,119,000 in June and $611,000 in July last year. About 75 per cent of the purchases in July was accounted for by metalworking machinery and equipment, principally machine tools for soviet automobile plants. For the first seven months of 1935 orders placed by Amtorg amounted to $16,167,000, as compared with $7,320,000 in the corresponding period of last year. Aside from machine tools, there have been large purchases of oil refining and metallurgical equipment, electrical apparatus, automotive and aviation equipment, freight-car wheels, electrodes, tin plate, sheet and strip steel.

Construction and Enterprise

Michigan

DETROIT—Budd Wheel Co. is taking figures for construction of a 1-story foundry building on Charlevoix avenue.

DETROIT—Brannon Inc. has been incorporated to manufacture machinery, by J. A. Anderson, 2857 East Grand boulevard.

DETROIT—Service Conveyor Co., 7764 Dryden avenue, has been formed with capital of $45,000 to manufacture mechanical handling equipment, by Gladys C. Scobie, 16183 Bayles avenue.

DETROIT—Progressive Welder Co. has been incorporated to deal in machinery, by Thomas M. Cummings, 737 Piquette avenue.

DETROIT—Health Air Systems Inc. has been organized with 50,000 shares of no par value by B. C. Bayne, 3784 Hogarth avenue, to manufacture air conditioning appliances.

DETROIT—Plymouth Motor Corp. Mt. Elliott and Lynch road, plans to install motors and controls, electric hoists, regulators, conveyors, and other equipment in four new plant additions. Cost over $600,000.

GRAND RAPIDS, MICH. — Don Lakie, architect, Grand Rapids, is taking figures for general alterations to buildings of the Michigan Brewing Co., Grand Rapids, to cost $100,000.

PLYMOUTH, MICH. — Plymouth Felt Products Co. is taking figures for erection of a factory building, 80 x 146 feet.

ROYAL OAK, MICH.—Royal Oak Tool & Machine Co. is planning to erect a machine shop to replace the shop destroyed by fire recently. Cost will exceed $35,000, including equipment.

SARANAC, MICH.—Lowell Metal Products Co. has been formed with $50,000 capital stock to manufacture compressed air sprayers and dusters and poultry equipment. A building has been leased here and the firm expects to begin production within 30 days. Later a plant will be erected at Lowell, Mich.

Indiana

FORT WAYNE, IND.—Board of public works, City Hall, is preparing plans for constructing a sewage treatment plant, costing approximately $1,500,000.

FORT WAYNE, IND. — Landenberger Road Equipment Corp. has been formed to manufacture road building and maintenance machinery, by John M. Landenberger, Emilie F. Landenberger and Frank W. Landenberger.

FORT WAYNE, IND. — International Harvester Co., E. C. Lutz, resident superintendent, Beurter road, is preparing plans and will soon take bids for a 1-story, 270 x 360-foot machine shop, a 2-story, 60 x 100-foot repair building, and a 1-story 90 x 120-foot equipment building. Cost estimated at $1,000,000.

LAFAYETTE, IND. — Ralston-Purina Co., 835 South Eighth street, St. Louis, plans to install motors and controls, conveyors, etc., in new soy bean refinery at branch mill here. Cost about $100,000.

MUNCIE, IND.—Muncie Malleable Foundry Co. has approved an appropriation of $100,000 for modernizing its manufacturing facilities.

Ohio

CANTON, O.—Alrey Steel Products Co., under management of Ray Nelson, has taken over the former Vulcan Co. property at Main street and Sashabaw road, and will start at once the manufacture of steel products.

CLEVELAND—H. J. Hunger Brass Inc. has been incorporated with $25,000 capital by Gilbert H. Wieder, M. E. Ganger and A. H. Ganger. Correspondent: Ganger & Ganger, East Ohio Gas building.

EAST LIVERPOOL, O.—City, O. Greenawalt, mayor, has recommended application to PWA for 45 per cent grant and 55 per cent loan for construction of municipal power plant and distribution system. Estimated cost $1,500,000.

McCOMB, O.—City will apply to PWA for aid in financing construction of sewage system. Estimated cost of project $50,000. H. P. Jones Co., Second National Bank building, Toledo, O., engineer.

Illinois

CHARLESTON, ILL. — City has plans for water supply improvements. Word, Walraven & Tilley, Springfield, Ill., are engineers.

CHICAGO — Brass Products Inc., 228 North Clinton street, has been incorporated by H. W. Anderson, R. C. Apel and E. G. Nelson, to manufacture and develop metal specialties. Correspondent: J. H. Hicks, 166 West Jackson boulevard.

Massachusetts

NEWBURYPORT, MASS. — City, water department, City Hall, plans improvements to pumping station, including installation of new boilers, piping, etc. Whitman & Howard, 89 Broad street, Boston, are engineers.

New York

NEW YORK—Department of hospitals, Municipal building, has plans for new electric light and power plant at Neponsit Beach hospital. Fund of $215,181 has been arranged

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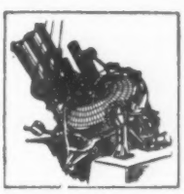

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Pennsylvania

MIDDLETOWN, PA. — Purchasing and contracting officer, air corps, Middletown air depot, will take bids Sept. 2, circular 2, for a 10-ton electric traveling crane, 1-ton electric hoists, 5-ton electric crane, 10-ton electric hoists, 3-ton trolleys and an elevator hoist.

OAKMONT, PA. — Universal Lubricating Co. plant was severely damaged by fire Aug. 1.

Kentucky

LAWRENCEBURG, KY.—City is having survey made by H. K. Bell, Lexington, Ky., for sewage disposal plant and sewage system, costing approximately $100,000.

Alabama

WOODWARD, ALA. — Woodward Iron Co., H. A. Berg president, is expending $240,000 for repairs and improvements to blast furnace No. 7, and air heating stoves.

Maryland

NORTH EAST, MD.—Town will vote Aug. 19 on $80,000 bonds for water and sewage disposal plant.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids Aug. 16, schedule 5680, on seven portable electric drills, delivered Mare Island, Calif.; Aug. 20, schedule 5702, main generator engine lubricating oil pumps, control appliances, and spares, delivered Portsmouth, N. H.; schedule 5705, motor-driven engine lathes; Aug. 27, schedule 5727, motor generators, control panels and spare parts, delivered Mare Island, Calif.; schedule 5730, one motor-driven horizontal boring machine; schedule 5735, one horizontal, boring, drilling and milling machine.

Georgia

BRUNSWICK, GA.—City will erect a municipal power plant and construct a street lighting system. PWA funds are being applied for. J. F. Ahern, consulting engineer, Jacksonville, Fla.

North Carolina

GREENVILLE, N. C.—City plans applying to PWA for funds for sewer project costing about $500,000.

South Carolina

SPARTANBURG, S. C.—City commissioners of public works, Dr. L. McD. Kennedy, chairman, have applied for $1,000,000 PWA funds for construction of hydroelectric power plant.

Tennessee

KNOXVILLE, TENN. — Director of purchases, Tennessee Valley Authority, will take bids Aug. 19 for five oil storage tanks for installation at Norris power plant.

MEMPHIS, TENN.—Fisher Body Corp., division of General Motors Corp., Detroit, has acquired plant of Murray Wood Products Co. on White street, and will install machinery for manufacture of wooden body parts.

West Virginia

MARMET, W. VA.—PWA has approved construction of $38,000 sewer system.

PARKERSBURG, W. VA.—PWA approved construction of $335,000 water and $135,000 sewer systems at South Parkersburg.

VIENNA, W. VA.—PWA has approved construction of $200,000 water works system.

Missouri

KANSAS CITY, MO.—Lou E. Holland has organized the Holland Corp. for manufacture of electrolytic etchers.

Arkansas

CROSSETT, ARK.—Crossett Lumber Co. plans to construct a $4,000,000 paper mill here, having capacity of 100 tons of paper per day. Financing has been arranged through RFC.

LUXORA, ARK. — City, R. G. Langston mayor, has applied for PWA loan of $78,109 for constructing a power plant. Moody & Co., National Standard building, Little Rock, Ark., engineer.

YELLVILLE, ARK.—Silver Hollow zinc mine, near here, has been leased by a syndicate and will be shortly put into operation.

Oklahoma

ADA, OKLA.—City has voted $38,500 waterworks extension bonds.

Texas

FORT WORTH, TEX.—City plans 13 projects at cost of $800,000, including erecting four 500,000-gallon elevated tanks, costing $140,000; installing new pump with capacity of 15,000,000 gallons daily, costing $35,000; rebuilding section and discharge piping at Holly pumping plant, costing $20,000, etc.

HOUSTON, TEX.—National Supply Co., Nance street, plans to install motors and controls, conveyors, electric hoists and other equipment in new multiunit oil well machinery manufacturing plant. Cost estimated over $400,000.

TEXAS CITY, TEX.—Pan-American Petroleum & Transport Co., 122 East Forty-second street, New York, plans installation of motors and controls, transformer equipment, electric pumping machinery and other power equipment in new additions to its oil refining plant here, to double present capacity. (Noted July 29.)

Wisconsin

CRANDON, WIS.—City has applied for federal aid to build waterworks and sewerage system costing $156,466. Jerry Donohue Engineering Co., 608 North Eighth street, Sheboygan, Wis., is in charge.

GREEN BAY, WIS.—International Harvester Co. will start work soon on a fire-proof addition, 93 x 120 feet, to the Green Bay branch plant, for use of motor truck division. Total investment will be about $125,000. G. M. Ahlschwede is branch manager.

MANITOWOC, WIS. — Daniel C. Bleser, formerly associated with local breweries, is organizing a new company which plans to build a brewery costing about $75,000. Richard Griesser & Son, 64 West Randolph street, Chicago, architects.

WHITEWATER, WIS. — Whitewater Brewing Co. plans reconditioning brewery and boiler house. Cost estimated at $30,000 or more.

Kansas

CHERRYVALE, KANS.—City has reports completed and plans to apply to PWA for loan and grant to finance waterworks improvements.

PITTSBURG, KANS.—City is preparing plans for waterworks improvements at pumping station. Black & Veatch, 4206 Broadway, Kansas City, Mo., engineers.

Colorado

DENVER, COLO. — Bureau of reclamation, will take bids Sept. 9, specification 638, on two 82,500 kv-a generators; specification 639, two vertical shaft, 115-000-horsepower turbines, and two governors with pumping equipment; Aug. 19, specification 707-D, eight 2-speed gear motors with reduction gears, all for Boulder power plant project.

GOLDEN, COLO.—George M. Bull, acting state director of PWA for Colorado, has been asked to approve a grant of $16,400 for a mining laboratory at the Colorado School of Mines, Golden.

Pacific Coast

ALAMEDA, CALIF. — City plans new power substation and transmission line to city-owned electric light and power plant. Cost about $125,000. Financing is being arranged through federal aid.

LOS ANGELES, CALIF. — Zellerbach Paper Co., 220 South Los Angeles street, plans installation of motors and controls, conveyors, electric hoists, loaders and other equipment in new 1-story storage and distributing plant, 182 x 942 feet. Cost about $225,000. Ralph Beebe, 1976 San Pablo avenue, Berkeley, Calif., engineer.

SEATTLE, WASH.—Mutual Machinery Trading Co., 1331 Third avenue, has been organized with $5000 capital, by L. F. Marion and associates.

Dominion of Canada

HAMILTON, ONT.—Camel Co. Ltd., J. R. Marshall president, plans to erect a plant for manufacturing fittings, etc., for railway cars, automobiles and airplanes. Cost estimated at $50,000.

ST. CATHERINES, ONT.—McKinnon Industries Ltd., subsidiary of General Motors Corp., Oshawa, Ont., is making plans for a 1-story 110 x 300-foot foundry unit. Complete equipment will be purchased. (Noted July 29)

Alaska

SEWARD, ALASKA — City has plans nearing completion and will call for bids soon for new city-owned hydroelectric power plant. Fund of $118,000 is being arranged for project through federal aid. Hubbell & Waller Engineering Corp., Alaska building, Seattle, consulting engineer.